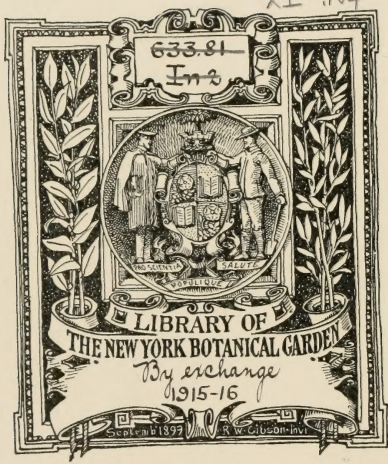


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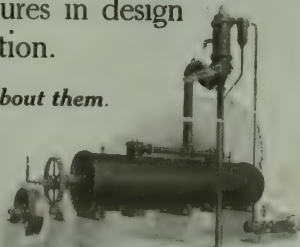
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"ENGLAND'S DICTATORSHIP."

TWO of the New York dailies, belonging to the type of journalism usually classed as "sensational," devoted much space in their issues of September 21 to what they chose to call the British seizure of the American rubber trade. They quoted at length—as live news—the articles of agreement entered into last January between the British government and the rubber manufacturers of the United States, which were set forth in detail in the February issue of THE INDIA RUBBER WORLD. This belated and extensive exploitation of the conditions which have governed rubber imports from British ports during the last eight months was occasioned by the protest of the German Embassy at Washington to the State Department concerning the control, or at least partial control, which England holds over various raw materials, including rubber, needed by the American manufacturer.

One of these dailies stated that an investigation was being urged to learn "if civil or criminal action should not be brought under the Sherman Act to end Great Britain's complete control of the rubber trade of the United States."

Just what civil or criminal action could be brought, and against whom or what, it would be highly interesting to learn. If the English choose so to guard their rubber as not to let it be used to aid their enemies they certainly appear well within their rights; and if American manufacturers want British rubber so much that they are willing to subscribe to the conditions laid down—the conditions *per se* involving no impropriety—they are surely justified in their course.

The other journal which gave so much space to this subject made this statement in conspicuous headlines: "Rubber Club as agent for Empire dictates terms to manufacturers." Nothing could be farther from the facts. The Rubber Club is not the agent of the British Empire nor has it dictated to any manufacturer or to anyone else.

When, last November, the embargo was placed on rubber shipments from British ports it was obvious to everyone that the American trade was confronted with a situation bound to be embarrassing and liable to prove extremely serious. It was evident that something had to be done and done at once. The most representative organization in the trade is the Rubber Club, and its officers, at great sacrifice of time, and fully appreciative of the burden they assumed, took up the task of finding the best and quickest means of securing for our manufacturers their normal and necessary supplies, and as a result of their efforts the embargo was removed. The instant relief to the rubber trade and the freedom from further vexation which it has since enjoyed is the best proof of the excellence of their work.

How necessary it was to comply with the terms of the British government, not only for the good of the trade but for the general welfare of the public, is shown by the import figures of crude rubber during the present year. Since the first of February, when the embargo was lifted, to the first of August, the crude rubber importations at the port of New York amounted to 11,364 tons from Brazil and 25,000 tons from London, all of this excepting 128 tons being plantation rubber. In other words, over two-thirds of our supply of crude rubber during the last eight months has come from London, none of which would ever have reached an American port except through compliance with the conditions laid down by the British government.

If no such agreement had been made and no rubber received by American manufacturers except the very inadequate supply coming from Brazil, the price of crude rubber would undoubtedly have remained at the high figure reached in the early days of the war, and might even have gone to the two-dollar mark, as has been the case in those European neutral countries which refused to comply with British conditions. In that event the price of rubber goods to the consumer would inevitably have mounted with great rapidity, and those journals which now decry "England's control of the American

rubber trade" would have fumed against the iniquities of the rubber robbers.

WHAT A MOUNTAIN OF SCRAP THE WAR IS MAKING!

WHAT a plethora of scrap rubber there will be one of these days when the war is over!

For the year ending June, 1914, the total imports of scrap rubber in the United States amounted to nearly 26,000,000 pounds, nearly 20,000,000 of which came from Europe. For the year ending last June, eleven months of which were included in the war period, the total imports of scrap rubber amounted to only 11,000,000 pounds. The Department of Commerce has not yet published its report giving the individual sources of this supply, but the figures have been compiled, and they show that the receipts from Europe for the last fiscal year amounted to only 4,286,195 pounds; hardly more than one-fifth of the amount received the year before and less than one-eighth of the volume received from that source in the year ending June, 1913.

Naturally the Germans are sending us no scrap rubber, though they have unearthed every piece of it in the Empire and doubtless have a larger accumulation than ever before. The neutral countries of Europe are also conserving every piece of rubber obtainable, and even in England and France, where new rubber is in fair abundance, there would, of course, be no disposition to export any considerable quantity of old rubber, which it might be a great convenience to have a little later.

More rubber is now on its way to the scrap heap than ever before in the history of the industry. This is an automobile war. For the first time in the history of military operations the motor car is the chief mobilizer. Troops, supplies, equipment, aeroplanes—all move on motor vehicles. At the beginning of the war, or soon afterwards, Germany, according to the best estimates obtainable, had 70,000 motor vehicles in military service; while the Allies doubtless had three times that number. Even assuming, as is often stated, that military auto-trucks last only a month (in all probability they last much longer) the Allies, or at least England and France, must greatly have increased their number of auto vehicles during the last twelve months. The English factories alone have been producing seven or eight hundred motor vehicles a day and their importations from the United States since the war began exceed 50,000. And there is no other rubber product that reaches the scrap heap so quickly as a tire on an auto in service at the front.

So, all in all, between the universal destruction of rubber goods in Europe and the lack of incentive for the present for collecting these rubber remains for the American reclaimer—as shown by the meager receipts

at our ports—the accumulation of rubber scrap on the Continent must be enormous, and the amount available for reclamation after the cessation of hostilities without precedent.

THE OPTIMISM OF THE AMAZON.

OPTIMISM is half the battle. In fact, to observe mathematical accuracy, it is probably two-thirds. Consequently it is pleasant to read in the letter which appears on a later page in this issue, from a man long identified with the rubber interests at Para that, no matter what the plantation people do, the Amazon will always be able to hold its own. His cheerful prophecy runs as follows:

"The Amazon will always be able to compete with Ceylon in prices. As cheap as they may be able to produce their rubber, the Amazon will be able to produce it still cheaper."

To be sure, the statistics of the Amazon, when compared with those of the East, have rather a pessimistic aspect. In 1905 the output of the Amazon country amounted to 35,000 tons of rubber. The product of the plantations amounted to 145 tons. The estimated yield for the present year is 35,000 tons for the Amazon, or just the same as 11 years ago, while the plantations will probably produce 90,000 tons. In other words, while the Amazon is just where it was a decade or more ago, the product of the plantations has increased during that period over 600 times. Moreover, while no one prophesies an increase in the Amazon production, at least for many years to come, careful estimators believe that within four or five years the plantations will produce 300,000 tons. Furthermore, men experienced with Amazon production place the cost of a pound of Upriver fine put on board at Para at 60 cents, while in the East many of the plantations have already reduced the cost of a pound of rubber to 25 cents, and in some cases to less than 20 cents.

In view of this deadly parallel a note of optimism from the Amazon is certainly most gratifying. Undoubtedly there will always be some rubber coming from the Amazon, regardless of price reductions in the East. But unless some comprehensive plan of colonizing labor is adopted, shipments from Para are likely in time to consist chiefly of such rubber as is easily accessible and which may be gathered in time which would otherwise be unemployed, and the returns from which, whatever the market price, will be viewed as so much clear gain.

The Story of Gutta Percha—III.

BOTANY.

It may well be imagined how great was the desire of all intelligent persons, when gutta was first brought to Europe, to know the identity of the tree from which it was derived. In 1844 the Rev. Edward White, Chaplain of Singapore, sent a dried branch of the tree to Dr. William Griffith, of the Madras Medical Service and superintendent of the Botanical Garden of Calcutta. There was neither flower nor fruit, but from the leaves Dr. Griffith was able to decide that it belonged to the Natural Order, *Sapotaceae*. He thought that it might belong to the genus *Chrysophyllum*, but would not pronounce on this matter. *Chrysophyllum*, however—though one species has been found in Malaya—is chiefly an American genus. It gets its name from the beautiful golden color of the underside of its leaves, and this peculiarity is shared by the tree which furnishes the gutta percha. The fruit of *Chrysophyllum cainito* is the star-apple of the West Indies.

It was not until 1846 that a flowering branch was sent to Kew Gardens by Mr. Thomas Lobb, botanical collector for the Messrs. Veitch, nurserymen of Exeter. Sir William Hooker made an examination of the plant and found that the corolla had fallen off, and while he was able to confirm Dr. Griffith in placing it among the Sapotads, he was yet unable to determine the genus. He thought it might belong to *Bassia*, an East Indian and African genus, which includes the butter trees of India. In 1847 specimens of branches with flowers and fruit were received by Sir William Hooker from Dr. Oxley, of the Indian Medical Service.

The amateur botanist is usually impatient with synonyms and often with good reason. The renamer, who spends his arid existence in trying to find excuses for renaming discoveries of better men, is an unmistakable nuisance and hardly a fit subject for conversation in which polite restraint is necessary. But it is a fact that even the greatest botanists are not infallible and the name chosen by Sir William Hooker was discarded by his own son at a later date. *Isonandra gutta* was the name under which this famous tree was first made known to the world. *Isonandra* is sonorous and rhythmical, though the meaning "equal stamened" is far from a distinctive trait. The genus had been established by Wight in 1840 and is represented by several species, along with which Sir William placed the newly determined species. This was in spite of the fact that *Isonandra* had its flowers in fours and the newcomer in sixes. This might

have been regarded as merely a specific difference if other species had not been found which agreed in this and other respects with the gutta percha tree, and in 1864 a generic difference was established by Thwaites under the name of *Dichopsis*. The specific name *gutta* was retained; and to this naming Bentham and Hooker agreed. Thus the matter stood until the late Dr. Burck, of the Dutch East Indian Service, called attention to the fact that Padre Blanco had in 1837 given the name *Palaquium* to indubitable specimens of the genus known as *Dichopsis*. By every rule in the establishment of nomenclature this name is entitled to stand and has now gained very general acceptance. This discussion is necessary to a correct understanding of the subject and there is really no excuse for the further use of *Isonandra* or *Dichopsis*. The question of correct nomenclature is of extreme importance to an intelligent understanding of any subject.

So it is *Palaquium gutta*, Burck, which takes its place in the botanical lists of all future time; and it is fitting that this honor should fall to one who has done so much for the knowledge of gutta percha and in preparing the way for its continued production. As to the question of whether *P. oblongifolium* and *P. borneense* should be recognized as species or as varieties of *P. gutta*, it must be said that in this, as in all like matters, the burden of proof lies with the "splitters" of species. The differences are but slight—size of leaf, etc.—and the three varieties, or species if it be insisted upon, furnish the only gutta percha of first class quality. Everybody is able to remember *Palaquium gutta* and there is certainly a call for good reasons when people are asked to remember three species instead of one.

The Order *Sapotaceae* is found in the tropical regions of Asia, the East Indies, America and Africa. The Sapotads are related to the Ebony and Storax families, but not to any order which includes any caoutchouc-producing plants. All of these families are represented in the United States, though by a very few species. Of the *Ebenaceae*, one is the persimmon. The *Styracaceae* includes the tree which produces the gum benzoin or gum benjamin, the source of the benzoic acid and benzoates of commerce.

Careless writers and even some botanical textbooks have called Sapotads "Soapworks," being misled by a curious resemblance of the words *Sapota* and *Sapindus*, the specific name *Saponaria* (the soapberry) of one *Sapindus* and the fact that several species of the latter possess saponaceous principles. But while *Sapindus* is "soap of India," *Sapota* is from the native Mexican name



LOW GRADE GUTTA, SANTAL BASSAL.

referring to the genus now have no relation whatever to saponin.

The fact that the woods of a few species contain saponin gives much less warrant for calling the Sapotaceae "Sapoworts" than would the same fact about the Pink Family. Another error which has been made by careless writers is to speak of the gutta percha tree as "guttiferous." This adjective is properly used only with reference to the *Euphorbia*, the Gumboe Family, which includes no gutta percha or rubber-producing plants. The resemblance in name is quite accidental, being derived from the Latin "gutta," meaning tear, and refers to the drops of resin which exude from trees of this order. The Sapotads—trees and shrubs—include forty genera and about four hundred species. All contain a milky juice, of which gutta percha, while the most important, is not the only one with commercial value.

Achras, which, as *Sapota*, gave its name to the order, furnishes the gum chicle which, as chewing gum, gives employment to unnumbered millions of American jaws. This tree, once *Sapota achras*, but now *Achras sapota*, bears the fruit known as the sapodilla or sapodilla plum, one of the most agreeable of tropic fruits, and it was cultivated in the West Indies for years before its gum had become the chief course at the barman's banquet of the present day American. Another very im-

portant Sapotad is the genus *Manihot*, found in the tropics of both hemispheres, and one American species, *Manihot* *balata*,

called *Manihot*. The *Sapotaceae* furnishes the valuable gum bearing the tree's specific name, which is also the name used by the natives.



GUTTA TARRAL, *ARTOCARPUS KUNSEFERI*

Not all the Sapotads yield a gum which by any possible license can be called gutta percha, and only *Palaequium gutta* and its two varieties or sub-species furnish the first class gum; but there are a number of trees, all belonging to the same order, which furnish gutta percha of a more or less inferior quality. They include *Palaequium*, *Pavina*, *Isopandra* and possibly some other genera. It is a matter of definition whether balata and the karite gum of West Africa be classed as gutta percha, but it is just such a question as to whether cauliflower is cabbage. The botanist says that it is, but the cook says it is not. The botanist, the chemist and the customs officials may be a unit in declaring these gums gutta percha, but the manufacturer has another opinion. And it is the opinion of the man who deals with the material that fixes the custom which lexicographers must confirm and all others admit. The botanist tells us that the bean-pod is a fruit while the strawberry is not; but when we order fruit with our breakfast we are likely to mean strawberries rather than bean-pods. But whatever the case about these gums, there is no doubt about such gums as the so-called pontianac gum, the "gutta jelutong," which comes from *Diopatra stipitata*, a gigantic tree of the *Diopatra* Family. They are not gutta percha,



PALAEQUIMUM GUTTA



PALAEQUIMUM OBCORDATUM



PAVINA LEERI

important Sapotad is the genus *Manihot*, found in the tropics of both hemispheres, and one American species, *Manihot* *balata*,

but low grade rubber. It may be said with all possible emphasis that no tree of the Natural Order *Sapotaceae* produces

necessity for rubber plantations exists and therefore no capitalist pays any attention to it."

"The rubber forests are boundless, inexhaustible. Hardly the fringe has been touched."

"What is the use of trying to do what the Almighty has done so well for us?"

It is necessary to make some such exhibit as the foregoing in order that we may understand the amazing frame of mind which has permitted the sweeping away of the forests which have supplied the gutta percha of which the world has stood in need. Buy all that comes; make all the money possible out of it; let posterity look out for itself. What has posterity done for us? Seventy years of this attitude have reduced the once abundant supply of gutta percha trees to such an extent that they are now found only in remote districts, where the remaining specimens are being mercilessly combed out. The usual solemn ceremony of locking the stable after the horse is stolen has been faithfully carried out and forest regulations have been made after the forests were stripped. It has been said that there was no danger of extermination because the natives would not kill out young trees for the reason that these would not produce gutta percha. As well say that

As this includes balata and as there is a little true gutta percha sent from the Far East to other European countries,

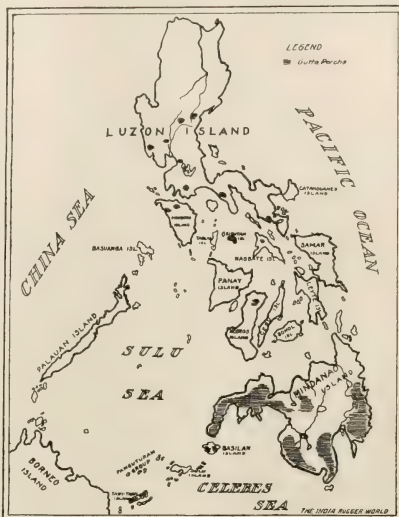
the two items may well balance each other; and five million pounds annually may be taken as the world's recent production of gutta percha. If the only use for gutta percha were the replacement of existing cable lines and these should last an average of forty years, half the present supply would be required to meet this demand. And when we consider that the present supply comes by natives going further and further into the fastnesses of the wilderness, it is evident that the end of the tale is near the telling and that it is a condition and not a theory that confronts us.

The gutta percha coming from some far tropic isle, where every prospect pleases and only man is vile, has had a long and unfortunate acquaintance with that vile exception and thousands of tons of concrete evidence of his villainy have been shipped across the seas in innocent cakes of gutta percha, which, like charity, is made to cover a multitude of sins. Of course, some bark and chips with other extraneous matter, like bits of the herbage on which the tree

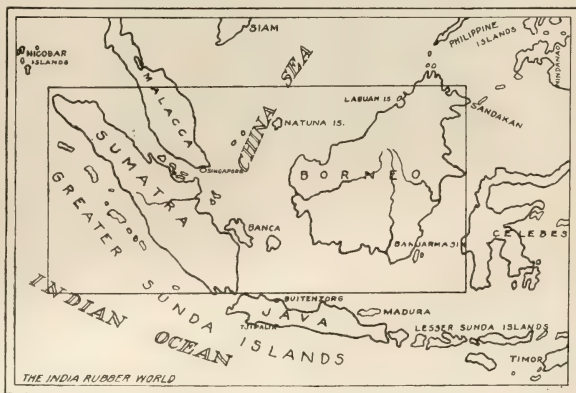
would be even a little of the soil, might reasonably be expected to be found mingled with an adhesive gum gathered by clumsy and careless workers. But this does not explain the sticks and stones, the dirt and rubbish of a thousand kinds which pass through the custom house, concealed by gutta percha, like nuts covered with chocolate.

But this does not explain the sticks and stones, the dirt and rubbish of a thousand kinds which pass through the custom house, concealed by gutta percha, like nuts covered with chocolate.

Analyses show that the dirt runs from practically nothing to as high as forty per cent. Dr. Sherman, of the Philippine Forest Service, says that the natives, in preparing the gutta percha for market, "place the dirt, bark,



MAP OF THE PHILIPPINES.
The Shaded Portion Shows the Distribution of Gutta Percha.



MAP SHOWING DISTRIBUTION OF PALAQUIUM GUTTA.
Rectangular Figure Marks the Area of Its Best Growth.

portations into Great Britain amounted to about five million sticks, stones, used-up hatchets, etc., on the inside as much as possible." (To Be Continued.)

Rubber's Service in Quarantine.

UNDER normal conditions 800,000 persons and \$800,000,000 worth of goods enter this country through the port of New York every year. Indeed, it is authoritatively stated that 70 per cent. of all the immigrants admitted to the United States annually do so by way of the metropolis. No wonder, then, that Dr. Joseph J. O'Connell, the health officer of that haven for foreigners, has declared that "The port of New York is the sanitary frontier of the United States." There are



RUBBER COVERED CASE FOR TESTING
DISINFECTANTS.

28 other seaboard cities where quarantine stations are maintained, and each and all of these serve as bulwarks or defenses against disease coming to our shores from other countries.

While the usual tide of immigration from Europe has been greatly reduced because of the World War, still the

number of foreign ships coming to our ports has materially increased, and because of this fact the quarantine of our seaboard cities must not flag in its vigilance. The average person imagines that it is the infected immigrant that is most to be feared. This is not the case, because the sick are comparatively easy to detect and so are those that are likely to develop some communicable malady. Our greatest peril lies in those apparently healthy people who, while immune themselves, are actually bearers of menacing germs. These "carriers," but for the tireless watchfulness of our quarantine officers, might all too easily get by into our populous cities, and once there they might form a center of infection that would soon involve scores and possibly hundreds of our citizens.

The story we have to tell is how these state and national officials work and are ever on the alert to safeguard the public health, and to describe the part in this vital service that rubber plays in many directions. Once more we shall see how this particular material meets the requirements with peculiar fitness, and through its agency the barriers are made more effective against alien enemies of the microscopic sort. The diseases likely to develop into epidemics are plague, typhus, smallpox, and cholera. We know fully well the ravages wrought by typhus in Servia since the beginning of hostilities in Europe a year ago.

Happily, it is definitely known now that the louse is the means by which this destructive disease is transmitted from a sufferer to a ready victim; and the health officer's problem, apart from dealing with the malady when discovered, is to hunt for these loathsome vermin upon incoming passengers and to place immediately under suspicion any person or persons of this sort, especially if they have been near anyone having typhus in any of its stages. These seemingly healthy but suspected foreign

arrivals are called "contacts," and are sent to a detention station for quarantine where they can be segregated and watched. In the case of plague, science generally holds the rat responsible for the spreading of this dire malady, and even though a ship may come in with a clean bill of health, still she must be subjected to thorough fumigation for the destruction of all rodents if the craft has come from a port which has been visited by this disease at any time during many months previous. This is particularly the case if the vessel has lain right alongside the dock at the infected port, so that rats could come aboard.

At present the disease most being feared of foreign origin is cholera. The war between the Balkan nations and the Turkish empire reintroduced cholera into Europe, and because of the large fleet of ships reaching our shores now for supplies from that continent it is all the more necessary that our precautions be redoubled. However, even though the peril is increased by the present great conflict, still Dr. O'Connell gives us this reassurance: "Rapid progress in the comparatively new science of bacteriology has given to sanitarians the immeasurable advantage of a precise knowledge of the causative agencies of cholera, plague, and typhus fever, the three scourges of major importance considered in connection with this war. Methods of isolation and sanitation have been worked out with the result of greatly augmenting the efficiency of public health officers."

Now let us see how rubber figures in this battle in behalf of the public health. We can best do this by describing some of the routine work at one of our ports. Let us assume that the ship to be inspected has come from an infected port, or that the foreign seaboard city is the outlet for a region in which



SPICING OFF WITH A SOLUTION OF BICHLORIDE OF MERCURY.

one of these communicable diseases is prevalent. For the sake of example let us choose typhus fever. The inspectors board the craft at quarantine. Each is armed with a clinical thermometer held in a hard rubber case. The gangways are guarded so that everyone on board must march before these officers, the number must tally with the ship's list, and no chance is given anyone to "repeat" so that a sick man can be impersonated by a well one while he lies hidden. In making this inspection, the quaran-

tine doctors frequently wear rubber gloves, and in rainy weather they don a rubber uniform from head to foot.

The typhus patients and the "contacts" are promptly removed, while the ship remains at quarantine for fumigation. The sick go to a ward or island set apart for the treatment of infectious diseases, and the "detains" are segregated elsewhere after undergoing an anti-parasitic bath. Their clothing is sterilized by steam. Each "contact" has a brass identification disc, hung upon a rubber cord or necklet, and a similarly numbered tag is fastened to his clothing while undergoing sterilization. All quarantine employees who handle patients and "contacts" are equipped with rubber gloves. Nurses and orderlies engaged in the sanitation of "contacts" and the treatment of patients wear rubber gloves and aprons, and the nurses' hair, tightly dressed, is covered by rubber caps.

In the disinfecting chamber the big iron doors are hermetically sealed by means of thick rubber gaskets, and in all of the detention rooms, which must be fumigated, all ventilators have rubber gaskets and the windows and doors are provided with rubber stripping so that these openings may be made both air-tight and vermin-proof. Indeed, this manner of sealing all spaces is uniform, so that every chamber at quarantine can be fumigated from time to time. We find the most extensive use of rubber in contagious disease wards. At Swinburne Island, New York, a thoroughly typical ward is provided with rubber flooring, pillow slips of rubber, rubber sheeting between the patients and the mattresses, rubber in various forms in the medical cases, while the attendants wear rubber-soled shoes to deaden sound. The modeling of all corners, combined with the wide use of rubber, makes it possible, after the removal of patients, to thoroughly fumigate and then to wash down the walls, ceiling, etc., by means of a hose turned loose freely. If any of the sufferers die, they are wrapped in rubber winding sheets before removal to the crematory for final disposition. Where vessels are disinfected after arrival with diseased patients, power pumps are employed for extensive work, and these use rubber hose having hard rubber nozzles of a duplex type, by means of which either a straight stream or a spray may be discharged.

The attendants in the bathrooms where the "contacts" are given an anti-parasitic bath, all wear rubber boots in addition to the rubber coats and gloves which we have already described. Of course, the usual rubber utensils, commonly found in hospitals, such as hot water bags, ice bags, tubing, rubber corks, etc., are abundantly in evidence. And in the bacteriological laboratory, where the specialists examine samples brought them from the incoming ships, rubber in many forms serves as nothing else will. One of our illustrations shows a sample case for testing the effects of a disinfectant on certain germs. This, when sealed, is covered with a close-fitting rubber cap.

But the quarantine service, both federal and state, is not alone concerned with keeping out diseased or germ-bearing persons. Our national welfare is very much involved in the proper administration of animal quarantine, both interstate and between this country and foreign ones. This is not confined alone to

living animals but to many products of the animal industry, such as hides, hair, wool, horn, etc. These can all carry disease-breeding germs, and where there is the slightest chance of infection they are not admitted to the country nor allowed to be moved from state to state until properly disinfected. This disinfecting takes a variety of forms, depending upon the nature of the material, but where the germ-killing spray is used the operatives commonly wear rubber boots and rubber hose is well-nigh indispensable in the proper distribution of the disinfectant. Cattle cars, stockyards, etc., are thus treated when necessary, and one of the commonest disinfectants is slacked lime.

Perhaps to the rubber industry the most interesting quarantine

campaign was that inaugurated last November and only recently brought to a successful conclusion. We refer to the battle here waged against the foot-and-mouth disease. The last previous epidemic was in 1908, but the widespread occurrence of this old world animal malady late last year was marked with a good deal of virulence. The District of Columbia and 22 states developed cases in varying numbers, but the disease was most serious in 15 of the states and called for the promptest sort of action on the part of the state quarantine officers. It should be of interest to know that the origin of the outbreaks of foot-and-mouth disease in 1902 and 1908 were definitely traced to imported vaccine virus used on calves in the propagation of virus for use in vaccinating against smallpox.

As soon as the disease appeared last November, the state and federal authorities immediately organized their quarantine forces, and an army of fully 1,000 inspectors was detailed to deal with the epidemic radically. This meant that every farm and every stockyard had to be visited and not a single head of cattle overlooked in the search for traces of the malady. The equip-

ping of this force made a good-sized demand upon rubber goods dealers. Each inspector had to be clothed in rubber from tip to toe. His outfit consisted of a rubber hat, a rubber coat, rubber gloves, and rubber boots reaching well above the knees. In addition to this he was provided with a white rubber fumigating cape.

The inspectors were called upon to examine the mouths and the hoofs of all beef cattle, and to see to the prompt disposition of the diseased and to properly disinfect the other animals and their quarters. It was not so much fear of personal consequences from the malady as to facilitate their washing down afterwards that the inspectors were clothed in outer garments of rubber. Each man had a tin basin and a sponge and his rubber clothing was liberally wiped off with a germicide bath of bichloride of mercury. But this superficial treatment was not enough to meet the exacting official requirements.

Least the underside of the rubber overcoat might have become infected, it was necessary to kill any germs lurking there and at the same time to disinfect the clothing lying closer to the body of the inspector. As our illustration shows, the white rubber fumigating cape fastens snugly about the neck and is ample enough to completely cover the wearer. By spreading out the



THE WHITE RUBBER FUMIGATING CAPE IN SERVICE.

bottom of the cape like a tent, the rising fumes from the disinfectant would be caught and held until they had done their intended work. For this fumigation a mixture of formalin and permanganate of potash were used in their crystalline form. When mixed, a vigorous reaction takes place, and a large quantity of formaldehyde gas is liberated. This method is particularly efficient on account of the rapidity with which the gas is given off as well as because of its searching quality and its bacilli-killing properties. Thus, before an inspector left an infected place and packed his belongings to go somewhere else, his rubber clothing was both disinfected and fumigated.

The actual disinfecting of barnyards, stables, stockyards and the like must, of necessity, be carried out on a larger scale than would be possible by hand distribution of the germicide. Accordingly, in Pennsylvania alone, the inspectors, of which there were quite 150, were provided with steam-driven disinfecting pumps. As these could not use bichloride of mercury without inviting injury to the mechanisms, cresol—a preparation of creosote—was employed for a disinfectant. The force had a battery of 25 pumps of this sort, capable of spraying a large area very quickly, and each pump had at least 100 feet of the best rubber hose. This gives some idea of the manner and extent in which rubber served to effectually deal with one of the worst epidemics of the foot-and-mouth disease.

Of course, there are other diseases that are more or less with us always, such as the result of the animal tick, tuberculosis, Texas fever, anthrax, hog cholera, etc. All our state and government inspectors are continually on duty, and their supervision extends to post mortem examinations of animals as well as to the examination of meats and meat products in the preparing. Some of this work is of such a character that the men must wear rubber boots and possibly rubber coats in the discharge of their duties. This is particularly so where animals have to be dipped in suitable germicide to kill the disease-breeding tick, etc.

In order to safeguard our domestic herds all imported animals are subject to inspection and quarantine just as are human immigrants. But this precaution is not always so confined. The service operates likewise to keep out certain diseases which are communicable from animals to people, as, for example, Malta fever—a malady which can be transmitted from infected goats by way of their milk. We have a number of animal quarantine stations where the incoming beasts are carefully watched for varying periods, and in the administration of certain divisions of this important work rubber plays its part to protect the operatives and to facilitate thorough fumigation and disinfecting. Despite the precautions which we insist upon before shipment from abroad, and the care taken in transit, diseased animals reach our ports, and for this reason our animal quarantine is most exacting.

The government owns and maintains three quarantine stations for animals imported through the ports of Boston, New York and Baltimore. The one at Athenia, New Jersey, 16 miles from New York, covers about 51 acres of ground and has 23 stables. The stables, most of which are modern brick structures, have a capacity of about 600 cattle. At every stage of their handling during the passage from ship to quarantine station,

disinfected cages and coats are available. Rubber hose and rubber garments are used extensively, and as the station is widely illuminated by electric lighting, rubber, of course, is a necessary insulator. As the scientific side of this work calls for a bacteriological laboratory, here, too, rubber figures in many ways.

In addition to those at Boston, New York and Baltimore, animal quarantine or inspection stations are maintained by the government at Chicago, Kansas City and South St. Joseph, Missouri; Omaha, Nebraska; National Stock Yards, Illinois; Indianapolis, Indiana; Buffalo, New York, and Pittsburgh, Pennsylvania, as well as at the following additional ports of export: Portland, Maine; Philadelphia; Norfolk and Newport News, Virginia; Port Royal, South Carolina; New Orleans, and Gal-

veston. Besides what the federal authorities do in this matter the states, too, do their part, and this makes in all a fairly sized army of inspectors and their subordinates. In addition, the railroad companies and proprietors of stockyards and stables located at the ports of export are required to keep separate, clean, and disinfected stockyards and pens or stables for the use of export animals.

All of the principal foreign nations maintain quarantine services like our own against communicable diseases reaching their shores through immigrants, tourists, etc., and certain of them exercise the same safeguards in keeping out livestock carrying the germs of infection. In some cases the inflicted animals are segregated only for a prescribed period, while in other ports diseased beasts are promptly exterminated. The Canadian government has patterned its service after ours in the matter of animal quarantine. It must also be remembered that we maintain inspectors abroad at the principal ports from which cattle for breeding purposes are shipped to this country, and there, too, india rubber finds kindred uses.

The pumps used for disinfecting are commonly of two kinds: those operated by hand and those functioned by either steam power or gasoline motors. The hand-power affairs are much like the pumps used for spraying orchards. The steam-driven apparatus, of course, are bigger and are intended to deal quickly with larger surfaces. With all of them rubber hose and a good deal of it is needed.

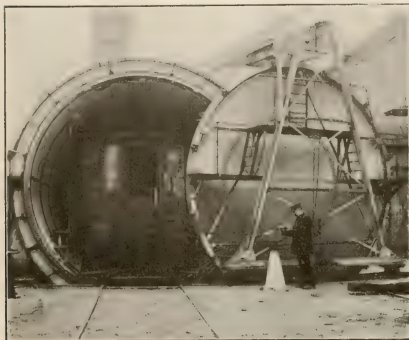
But we are no less careful regarding the animals shipped out of the country, for the volume of that business depends entirely upon the healthfulness and the desirability of American livestock. Therefore, our inspection of these animals for export is extremely exacting, cattle are tested with tuberculin for the detection of tuberculosis and equine animals with mallein for the detection of glanders. During the five years ending with 1913, the Bureau of Animal Industry made over 2,500,000 inspections of animals for export. These places of inspection are scattered all over the United States. Today, because of the war in Europe, we are exporting a still greater number of animals to supply the needs of some of those foreign nations.

No ship is allowed to take cattle from our shores unless it is in a fit condition to receive them and likely to carry this livestock to the other side and deliver them there in a healthy and acceptable state. To make these vessels proper carriers it is needful to disinfect them, and again rubber lends its invaluable service to the proper execution of this precautionary work.



INSPECTING A STEER'S MOUTH.

To refer again briefly to the European war, while various antitoxins have done much to reduce mortality, still the vast armies in the field would long ago have been decimated by one or more scourges but for the modern methods of disinfecting camps, trenches, and hospitals. The medical staffs of the several armies have looked very well, indeed, to this form of defense



A HUGE FUMIGATING TUBE HOLDING AN ENTIRE TRAIN

against devastating fevers, and it is in this particular that the present strife stands out in vivid contrast to past conflicts.

The one malady, however, that has caused an enormous sacrifice of life has been typhus. This has lingered in the Balkan region since the war there several years ago, and within the past twelve months Serbia has suffered frightfully from that fever's ravages. The Russians also contracted the disease during the campaign in the Carpathians and in Galicia, and the Teutonic medical men, especially those of the German armies, have taken



CAR BEING FUMIGATED BY STEAM FROM A LOCOMOTIVE.

effectively means to rear a barrier against the spread of that scourge among the Kaiser's forces and in the Fatherland where Russian prisoners are quartered.

For this service they have had recourse to the sterilizing power of steam. The particular object of this method of attack is the typhus-transmitting louse. Unhappily, the filthy creature is a

very common thing among the lower classes of the Czar's subjects, and the hardships of camp and march have engendered careless personal habits, thus favoring the propagation of these disease-carrying insects. As a precaution, the Germans have instituted disinfecting plants at many points for the sterilizing of clothes and the destruction of these vermin. All railroad trains used for bringing in from Russia either Russian or German wounded from the eastern field of action are thoroughly cleansed in this fashion by steam. At Potsdam, for instance, a great steel cylinder, sealed at both ends by circular doors seating on rubber gaskets, makes it possible to run a whole train inside for sterilization. The steam, hot water, or formaldehyde is delivered by rubber hose from an available plant. Again, the same death-dealing vapor is blown into other cars used for transporting troops to and from the eastern theatre of war, and thus disease germs of every kind are effectively disposed of. Our illustrations give a very comprehensive idea of the means and the methods employed in this vitally necessary service.

ITALY AS A MARKET FOR AMERICAN RUBBER GOODS.

Although a state of war has never been officially declared to exist between Italy and Germany, the former's entry on the side of the Allies has broken off all her commercial relations with the German empire.

Italy has been a large purchaser of German rubber goods, but it is a question whether she will be so in the future if it can be avoided. The latest available statistics of the rubber trade between Germany and Italy are for 1913, which was the last normal commercial year. These statistics only show direct imports from Germany, not taking account of the large quantities of German rubber goods that reached Italy indirectly through other countries. They show that Italy imported 54,533,600 pounds of German rubber goods, consisting principally of rubber sheet, rubber solutions, rubber thread, hose, tubing, solid and pneumatic tires, printing cloths, rubberized and elastic fabrics, rubberized garments, mechanical goods such as packings, belts, etc., rubber and gutta-percha covered wires and cables, and hard rubber goods. The most important imports were insulated cables and wires.

The war will undoubtedly result in the extension of the uses of rubber and rubber goods in Italy. Italians will hardly be disposed to purchase from Germans if they can do otherwise with equal satisfaction. Italy should, therefore, offer a good field for American rubber manufactures.

AMERICAN EXPORTS OF MOTOR VEHICLES.

The fiscal year ending June 30, 1915, marked the close of an exceptional period in the annals of the American motor truck industry. Exports of commercial motor vehicles amounted to 13,996 machines, valued at \$39,140,682, as compared with 784 vehicles, valued at \$1,181,611 exported during previous fiscal year and 993 commercial automobiles valued at \$1,737,141 exported during the 12 months ending June 30, 1913.

The year 1914-1915 was less favorable to exports of pleasure cars, which only amounted to 23,880 cars, valued at \$21,118,953, against 28,306 machines, valued at \$25,392,963 during the previous year and 24,292 vehicles, valued at \$24,275,793 exported during the fiscal year 1912-1913.

AEROPLANES ARE IN DEMAND ABROAD.

During June and July of the present year Great Britain imported from the United States aeroplanes valued at \$765,544. Italy imported aeroplanes worth \$10,105, and Mexico imported \$3,535 worth of flying machines during the same period.

REDUCTION IN PENNSYLVANIA TIRE PRICES.

On September 1 the Pennsylvania Rubber Co. reduced the prices of its smaller sized vacuum cup tires. The following are some of the new prices: 31 x 3 3/4, \$16.90; 30 x 3 3/4, \$16.20; 30 x 4, \$19.55; 28 x 3, \$12.65; 28 x 3 3/4, \$15.40.

What the Rubber Chemists Are Doing.

VARIATION IN RATE OF VULCANIZATION OF RUBBER.

THE "Malay Mail" reports a lecture on "The Variability of Rubber," delivered in July at Klang by B. J. Eaton, chemist of the agricultural department of the Federated Malay States.

The lecturer referred to two terms of frequent occurrence—standardization and uniformity—both as yet hazy and indeterminate. There is a marked tendency to look to fine hard Para as the standard because manufacturers have had experience with it extending over many years. That, however, is the only argument in its favor. The term uniformity, as applied to rubber, means rubber of the same type. Different types of rubber may vary in mechanical strength, but variation in vulcanizing quality is far more important to the rubber manufacturer. The matter of form and appearance is of little consequence to the manufacturer, although important to the broker, buying and selling on looks rather than by test.

In vulcanizing rubber with sulphur the manufacturer has recourse to three methods in securing a given result. He may vary the amount of sulphur, or the temperature and time of vulcanization. In the experimental work of the agricultural department, the sulphur and temperature were fixed and the time varied. In the original experiments all the rubbers tested gave their best results in $2\frac{1}{2}$ to $2\frac{3}{4}$ hours. Different mechanical results were obtained by changing the time of cure. Subsequently a piece of Byrne-cured (smoked) slab rubber gave its maximum mechanical results at $1\frac{1}{2}$ hours' vulcanization. Ordinary Byrne-cured loaf vulcanized in the normal time of $2\frac{1}{2}$ to $2\frac{3}{4}$ hours, and the inference was drawn that the Byrne method of smoke curing has no effect on the rapidity of cure.

To demonstrate this point rubber slabs were made and smoked in an ordinary smoke house, and these were vulcanized in $1\frac{1}{4}$ to $1\frac{1}{2}$ hours. Then unsmoked slabs of pan coagulum, made the same thickness as the smoked slabs, were tested and found to vulcanize much more quickly than either the Byrne-cured slab or the ordinary smoked slab. Evidently this was due to the form in which the rubber was prepared, and had nothing to do with the smoking which actually retarded the vulcanization.

Further experiments led to the conclusion that an alteration or a presence in the latex, and in the coagulum, caused this marked variability in the rate of vulcanization.

Rubber consists approximately of 94 per cent. of caoutchouc, 1 per cent. of mineral salts, 2 to 3 per cent. of resins, and 2 to 3 per cent. of protein. The ingredient most liable to change is the protein, and probably some substance derived from this acts as an accelerator. Experimentally it was found that this change occurs in the coagulum if left for six days before being creped. No evidence of this change can be detected in the appearance of the rubber, which in consequence requires to be tested to ascertain its vulcanizing quality.

As concerns rubber estate practice several factors affect vulcanization. These are thickness, *i. e.*, amount of serum removed; smoking, which retards vulcanization; the use of formalin or other preservatives; amount of acetic acid used in coagulation, and the dilution of the latex. The age of the tree also affects the proportion of protein and other constituents of the latex.

The more uniform methods now adopted on many estates tend to greater uniformity of product; but variability is due chiefly to the difference in rubber from different estates.

In these experiments, in preparing the block of pan coagu-

lum, which was left in this form for some days, a really new type of rubber has been discovered. It vulcanizes more rapidly than fine hard Para and ordinary plantation grades, which take medium time. Only eight or nine samples of fine hard Para have been tested so far, but it is remarkable that all vulcanized in about the same time.

It is, therefore, natural for the small manufacturer to rely on fine hard Para. The reason for its lack of variation is attributable to the uniform method of its preparation, and not because of any intrinsic value of the method. As it may require two or three months to prepare a ball of fine hard Para, any variations in its quality are averaged.

The formation of the accelerating substance is believed to be effected by bacteriological action. Rapid curing samples show better mechanical tests than those that cure slowly.

Rapid vulcanization eliminates the danger of overheating, and that is probably the reason for the increase of strength.

The lecturer credits Dr. Schidrowitz with first pointing out this variability in rate of cure in plantation rubber, of which the experiments at the agricultural department first showed the cause. It is possible now to prepare a rubber which will vulcanize correctly at any particular time, within certain limits.

In conclusion, Lawrence Lewton-Brain, director of agriculture, Federated Malay States, remarks that, although an insufficient number of experiments have been completed, the results already obtained indicate that the variability in the rate of cure is probably caused by a difference in the quantity or quality of certain non-caoutchouc constituents of the latex, which remain in the rubber after coagulation. There may be other factors, such as the physical condition of the caoutchouc which affect the quality of the material as regards elongation and tensile strength. This problem is now being investigated.

POTASH FROM HEVEA.

The following analytical data appeared in a review of the potash situation given recently in one of the papers published in the tropics:

Hevea:	Ash. Per cent.	Potash. Per cent.
Dark	10.6	9.2 on ash
Leaves	4.4	25.8 on ash
Leaves, old	4.4	4.7 on ash
Wood	6.0	13.5 on ash
Seed husk	1.6	0.31 on sample
Seed meal	3.4	..... on sample
Latex	0.35	43.0 on ash
Crépe	0.4	23.4 on ash
Riscuit	0.4	26.4 on ash

SULPHIDE OF CARBON AS A VULCANIZER.

Mathews and Strange have discovered that a solution of natural or synthetic rubber subjected to 40 per cent. carbon disulphide in a closed vessel, turns into "gel" which, when dried, is vulcanized rubber.

COAGULATION OF LATEX BY ELECTRICITY.

Coagulation of rubber latex by electricity has been successfully performed on plantations where acetic acid was scarce. This coagulation is effected in a porous vessel with carbon electrodes, using a low tension current. The latex is slightly diluted with water and the gum separates very rapidly. It is perfectly clear and limpid.

INFLUENCE OF PROTEINS AND RESINS UPON VULCANIZATION.

In a very interesting study Stevens shows the influence of these two substances upon vulcanization. Rubber, completely freed of its proteins and resins, only sets 18 per cent. of sulphur, whereas when simply washed it sets 280 per cent. of sul-

tion. The breaking strength is increased in the first case and in the second case becomes almost double. The stretching characteristics vary in the same manner. By adding resins, properties of elasticity, impact resistance, and adhesion and the physical characteristics are increased.

ACETONE INSOLUBLE RUBBER PERCHLORIDE

DIKONER has obtained a series of rubbers in various proportions of resins, gutta percha and sulphur and thus obtained a series of bonites. By this treatment an important percentage of resin becomes insoluble in acetone, in proportions varying between 2 and 4 1-2 per cent.

RUBBER SUBSTITUTES

A modified form of sulphurized oil rubber substitute has recently been patented by an Austrian chemist, V. Ottorepitz British patent No. 21,524 (1914). The substitute is made from fatty vegetable oils by the combined action with heat of sulphur and dilute nitric acid. In this way a tough substance is obtained which is soft when hot and elastic when cold. After washing, this material is vulcanized with sulphur in the same manner as ordinary india rubber. The following is an example, in detail, of the manufacture of this product.

To one kilogram of linseed oil 150 grams of sulphur are added and the whole heated to 130 degrees C. to dissolve the sulphur. This liquid is poured into its volume of dilute nitric acid; heated and agitated for several hours in a water bath until the liquid is converted into a yellow body which is soft when hot and elastic and tough when cold. Notable quantities of sulphuric acid are to be found in the nitric acid. This body is thoroughly washed with water, and dried in thin layers at 100 to 110 degrees C.

To one kilogram of this dried material, 200 grams of flowers of sulphur and a sufficient quantity of benzol is added for converting the whole into a gelatinous dough which is then dried and vulcanized by heating. The product thus obtained is said to be tough and elastic and to serve as a successful substitute for rubber.

PATENTED TREATMENT OF RUBBER.

PURIFYING ISOPRENE.—F. E. Matthews and E. H. Straub—British patent No. 6,897 (1914)—purify unsaturated hydrocarbons (isoprene) by treatment with sulphurous acid and alcoholic hydrochloric acid.

ACCELERATORS.—British patent No. 10,833 (1914); addition to No. 4,263 (1914). (See THE INDIA RUBBER WORLD, August, 1915). S. J. Peachy. Parantitrosodiphenylamine or reduction products of the nitroso-compounds mentioned in the parent specification—such as dimethyl-paraphenylenediamine—are used for accelerating the vulcanization of natural or artificial caoutchouc.

LEATHER, WATERPROOF AND NON-SLIPPING.—United States patent No. 1,150,047, Alex. McLennan. Leather is treated in a drum with a solution of rubber and celluloid in acetone, together with a solution of amber resin dissolved in benzol and a solution of juniper gum.

CONDENSATION PRODUCT WITH RUBBER.—United States patent No. 1,150,642, Hans Stockhausen. Heating formaldehyde with phenol until a liquid intermediate product is formed, and mixing this product with ferric chloride until a plastic, moldable mass is obtained, which mass is mixed with caoutchouc and sulphur, and hardened by heat.

RUBBER SUBSTITUTE.—British patent No. 1,171 (1914), Joseph Baier and Arthur G. M. Weale. Dry animal tissue is converted into a viscous jelly by treatment with zinc chloride solution or hydrochloric acid, thickened with dry, starchy matter, and air dried. A solution of rubber in turpentine is then mixed to form with it a thick dough. The paste thus formed is the rubber substitute and is applicable to leather or fabric. The substitute may be cured by heating at 250 degrees C. till tough.

SUBSTITUTE FOR EBONITE.—British patent No. 76 (1914), Ernst

Krause and Hans Blucher. Albuminous and cellulosic yeast residue is mixed with dry powdered albumen to a uniform mass. This is treated with formaldehyde and the water removed by pressure and evaporation. Ebonite-like material is obtained from this material at 100 degrees C. under high pressure.

RECOVERING RUBBER FROM AUTOMOBILE TIRES.—British patent No. 16,116 (1914), H. Delaigue. The tires are soaked for two or three days in xylol or other solvent, when the fabric can easily be stripped away from the rubber. The rubber attached to the fabric layers can be removed by a revolving wire brush. The rubber is ground while in the brittle, swollen condition produced by the solvent, and the latter recovered from the rubber and fabric by steam or dry distillation,—in the latter case under reduced pressure. The solvent may also be removed by washing with acetone or alcohol. (THE INDIA RUBBER WORLD, October 1, 1914.)

COAGULATION OF LATEX.—British patent No. 1455, Carlos de Cerqueira Pinto. A coagulating preparation consisting of a mixture of varying proportions of creosote, hydrochlorate of quinine and carbonate of soda dissolved in alcohol. This solution is diluted preferably with the wash water resulting from washing coagulated latex, and the dilute mixture added to the latex to be coagulated. The coagulation takes place rapidly and the rubber obtained possesses the entire nerve of the latex employed.

RECLAIMING WASTE RUBBER.—British patent No. 12,271 (1914), Frank Vincent O'Neill, Boston. A process for dissolving out the caoutchouc from vulcanized waste rubber. The waste is treated in a closed receptacle, under pressure (about 60 pounds) at a temperature below that detrimental to the rubber product (266 degrees F.) in the presence of boiling resin spirit. The solvent is removed from the dissolved and devulcanized rubber by evaporation. The product is said to have all the characteristics of the original rubber compound before vulcanization.

SYNTHETIC SUBSTITUTE FOR GUTTA PERCHA, BALATA AND CAOUTCHOUC.—British patent No. 17,253 (1914), Arthur Heinemann. A process for producing a homogeneous substance possessing properties similar to gutta percha and balata from butadiene and the like; such as isoprene, dimethyl, butadiene and generally hydrocarbons possessing two conjugate double links. These hydrocarbons are dissolved in acetone and polymerized by passing sulphurous acid gas into the solution. The resultant precipitate of polymerized hydrocarbons is then compressed for four days at 6,000 pounds per square inch to remove the oily liquids present and produce a homogeneous mass. The product is vulcanizable with sulphur.

PLASTIC COMPOSITION.—J. S. Campbell, British patent No. 9,370 (1914). Plastic composition consisting of a mixture of finely divided leather, fatty or resin oils, mineral fillers, sulphur and rubber, gutta, balata or rubber waste adapted to be calendered or dissolved and spread on fabrics, prepared by vulcanizing for use as packing, shoe soles, belting and tire treads.

PONTIANAK (JELUTONG) RUBBER RESIN.—Charlton Ellis and A. A. Wells have done much experimental work on Pontianak resin solutions. Their conclusions are: (1) Of the solvents or thinners commonly used in varnish and paint oil making, benzol is the most energetic on Pontianak resin. (2) Heating the resin for an extended period makes it more soluble and increases the proportion of unsaturated bodies. Temperatures above 650 degs. F. exert a marked influence, both as to solubility and chemical and physical properties. (3) Pontianak rubber resin is very inert to alkalis and, practically speaking, may be regarded as unsaponifiable.

THE interesting work on "Sulphide and Sulphate Sulphur" reported in this department last month should have been credited to H. P. Stevens, M.A., Ph.D., F.I.C. [An interesting discussion on the subject of Pontianak resin will be found in THE INDIA RUBBER WORLD, July, 1909.]

THE NATIONAL EXPOSITION OF CHEMICAL INDUSTRIES.

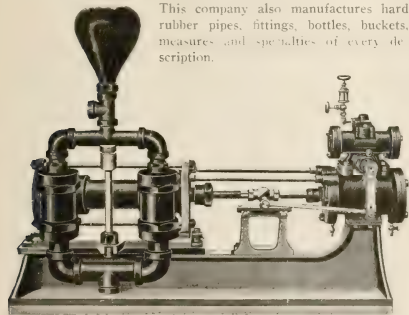
THE first exposition held in America devoted exclusively to chemical industries took place in Grand Central Palace, New York City, from September 20 to 25.

The progress of chemical industry was interestingly demonstrated by the attractive exhibits of 80 or more manufacturing companies and chemical, engineering and metallurgical societies, in addition to an extensive exhibit by the Bureau of Standards, Department of Commerce of the United States.

The chemical and allied industries represented, included paper, pulp, asphalt, explosives, aniline and vegetable dyes, hard rubber appliances for use in handling acids and other chemicals; molded dielectric materials, refractories, glass, abrasives, copper, lead and rare metals; laboratory apparatus; instruments for measurement of heat, electricity and pressure, and a large and varied display of machinery adapted for chemical manufacturing operations, such as mixing, distilling, draining, drying, evaporating, pumping and weighing.

Certain exhibits had special interest for the rubber chemist and manufacturer. Among these should be mentioned the display of chemical apparatus made by the Bureau of Standards, Lenz & Naumann, and Eimer & Amend. The latter showed the direct reading gravimeter of Young designed particularly for determining the specific gravity of rubber samples. Lenz & Naumann showed a torsion balance, by C. Becker & Co., for reading specific gravity of heavy liquids. The well-known and efficient mixing and solution churns of Werner & Pfleiderer have practically become standard in many branches of industry, and types were shown adapted to light work generally.

The American Hard Rubber Co. displayed a general line of vulcanite utensils for handling acids. This company also manufactures hard rubber pipes, fittings, bottles, buckets, measures and specialties of every description.



An interesting installation in their booth was a large electrically driven pump in operation, the liquid end of which is built entirely of hard rubber to withstand the destructive action of acids, alkalis, dyes or other corrosive liquids. The illustration shows one of these hard rubber pumps connected for steam instead of electrical operation.

Bakelite and condensate products were shown in great variety by the respective companies. These well-known products have remarkable adaptability, due to their chemical and physical qualities. In particular they are found as the insulating feature of many complex electrical devices and instruments.

An extensive line of machinery was exhibited, especially adapted to industrial chemical operations, with interest centering largely in that designed for the manufacture of dyes and accessory materials. In this connection the Buffalo Foundry & Ma-

chinery Co., Bethlehem Foundry & Machine Co. and Duriron Iron Castings Co. featured the anti-corrosive qualities of the cast iron used by them in the manufacture of kettles, stills and connections for handling acids. Samples of the metal were shown in comparison with ordinary cast iron, in sulphuric, nitric and hydrochloric acids. The machinery exhibit of the J. P. Devine Co. was limited because of the demand for their commercial apparatus, practically to laboratory apparatus, such as autoclaves, vacuum pans, pumps and vacuum dryers. Complete aniline manufacturing plants have recently become an important section of their output of general chemical machinery.

The work of the Bureau of Standards of the Department of Commerce was attractively displayed in distinct sections with placarded statements of the scope of each division of the work, which was made clear by actual apparatus and samples of materials examined, and by numerous photographs of testing machines used; and also a collection of the publications of the Bureau.

The scope of the work of the Bureau, as relates to rubber, embraces the following: Chemical, physical and electrical tests upon crude rubber, rubber hose, bands, valves, packing, gaskets, gloves, insulated wire and submarine cables; research and publications; methods of chemical analysis and physical testing; specifications; direct determination of rubber, mixing and vulcanizing of rubber; experimental plant for manufacture of rubber goods; testing mechanical rubber goods; physical properties of rubber, and the effect of temperature on physical properties.

EDITOR'S BOOK TABLE.

THE FINANCIAL RUBBER SHARE HANDBOOK. TWELFTH EDITION, 1915. The Financier & Billbroker, Limited, London. 140 pp. 8c., 815 pages. Price 2s. 6d., net.

THE Rubber Share Handbook is a compilation of information regarding some 500 companies owning rubber producing properties in the East, Africa and South America, and gives in each instance the capital stock of the company, shares issued, office address, list of directors, cost of estate, and statistics of production, costs, etc. It also contains particulars of the industry generally, the following table, taken from the preface, showing the world's rubber production for the past two years with estimate for 1915, and the rate of total increase:

	Plantation.	Brazil.	Rest.	Total.	Increase per cent
1913	47,618	39,370	21,452	108,440	9.6
1914	71,380	37,000	12,000	120,380	11.0
1915	85,000	35,000	5,000	125,000	4.0

The author gives as his opinion that there is no present cause for anxiety among investors as to the price and supplies of crude rubber, but rather that the possibility may be kept in mind of an actual shortage by the end of the year, the war having created an increased demand. With regard to the future, the belief is expressed that the rubber producing industry is approaching a somewhat critical period. The year 1916 will mark the coming into bearing of large plantings made during 1911, from which a production of from 10,000 to 15,000 tons may reasonably be expected. This, with the 100,000 tons estimated as the 1916 output of the 750,000 acres planted prior to 1911, indicates an increase in plantation production of 25,000 to 30,000 tons.

Discussing the situation created by the war, since the commencement of which Germany and Austria—whose combined receipts of rubber for 1914 amounted to 14,000 tons—have succeeded in importing only a very small quantity of this material, the author believes that these countries will find it necessary at the close of the war to immediately replenish their depleted stocks. He also believes that, though there may be a temporary drop in rubber prices when peace seems imminent, due to dis-

continuance of the manufacture of military supplies, this will be compensated for by resumption of activities in other lines that have been affected by the war. Of course, there is little chance of a commodity continuing to sell at more than twice the cost of production when the supply is rapidly increasing, but there is good reason to believe that plantation rubber will always yield substantial if not phenomenal profit to its producers. Some of the old-established plantations have already reduced their cost of production to the neighborhood of 9d (18.24 cents) per pound, and the chances are that further reductions will be possible, though generally the cost on a yield of 400 pounds to the acre amounts to about 1s (24.33 cents) per pound. The cheapest producers to date are in the Straits Settlements. Ceylon's advantages in the matter of general expenditure are counter-balanced by a poor soil which necessitates the extensive use of fertilizers and naturally adds to the cost of production. The same applies to a great extent to Southern India. Sumatra should ultimately be able to produce crude rubber as cheaply as Malaya, but although the same claim has been made for Java, results do not appear to sustain the contention.

Regarding production per acre the editor states that he has fixed 400 pounds as an average for mature plantations, but that the productivity of rubber estates varies, like costs of production. Climate and soil are the two principal factors in rubber production, and in these respects Malaya is most favored, with Sumatra and North Borneo nearly as fortunate; so that these three countries should stand first in respect to yields. Fertilizers have enabled Ceylon to keep well up with Malaya in rubber yields in spite of her less favorable climate and poor soil. Droughts in Java are against that country's obtaining yields equal to those obtained in the other rubber producing countries, and Java is not likely to average more than 100 pounds of *Hevea* rubber per acre.

Of course, these facts do not necessarily affect the value of estate investments, for shares in an estate producing 600 pounds of crude rubber per acre may be inferior in value to holdings in another property yielding only 300 pounds per acre; everything depending upon the share market capitalization per acre of the respective estates.

Rubber trees in Malaya, Sumatra and North Borneo are generally considered tappable at the end of the fifth year, when the trees are about 18 inches in girth at 3 feet from the ground. In Ceylon, India and Java the tappable stage is reached about one year later. This is true only of plantations where there are no intercrops, for, when *Hevea* is interplanted with tea, coffee, cocoa, etc., the development of the rubber-producing trees is retarded, in some cases, as much as two years.

NEW TRADE PUBLICATIONS.

OUTING, SPORTING AND TENNIS LISTS.

THE new price lists of the United States Rubber Co., issued September 1, and covering its various brands of sporting, outing and tennis shoes, show what great expansion has taken place during the last few years in this particular department of rubber footwear. The company has issued five different lists as follows: "United States Rubber Co.'s Sporting and Outing Shoes," "The Glove Brand of Canvas Rubber-Soled Shoes for Tennis, Yachting and Dancing," "The Hub-Mark and Rival Rubber-Soled Canvas Shoes for Yachting, Tennis and Summer Wear," "The Rival Tennis" and "Vim Tennis."

All these lists are of uniform size, $3\frac{1}{2} \times 6\frac{1}{2}$, but they vary in the volume of contents from the list of Sporting and Outing Shoes, which contains 28 pages, to the Rival and Vim Tennis lists, which consist of a single card. The twenty-eight page list contains thirty-six illustrations and describes over twenty different types of rubber-soled summer footwear. This list is quite an

artistic creation, being printed in black, blue and buff and having at the top and bottom of every page some scene in colors appropriate to the shoe described. These little sketches, which are deftly done, show tennis, yachting, golf, camping, baseball and a variety of other spirited scenes.

The Glove brand list contains sixteen pages and shows as many half-tone illustrations of the outing shoes made in this brand. The Hub-Mark list is confined to eight pages and contains half-a-dozen illustrations showing the yachting, gymnasium and tennis shoes made with this popular trade-mark. The Vim tennis list is evidently intended for people who want comfortable summer shoes at a very comfortably low price. This brand embraces only Oxfords and the prices, which are net in all these different lists, run from 40 cents for men's to 32 cents for children's sizes.

The growth of the popularity of the canvas rubber-soled shoe and the development of different types to supply every demand, constitute one of the most interesting features of recent rubber footwear history.

SOME FIRESTONE BOOKLETS.

"Mileage Talks" is an interesting booklet of 24 pages, in octavo size, published by the Firestone Tire & Rubber Co., of Akron, Ohio, to show on just what tire mileage depends.

The booklet is full of information about tires, their durability and details of their construction. The whole is generously illustrated.

Another enterprising Firestone publication is evidently intended to assist retailers in utilizing Firestone advertisements. It is a 16-page booklet, $10\frac{1}{4} \times 6\frac{3}{4}$ inches in size, the title, "Boom" spectacularly illustrated in black, pink and green on the cover by the blast of a cannon. Within are specific descriptions of the various Firestone "ads"—which include folders and catalogs, road signs of steel and cloth, posters, hangers, and even lantern slides—with "live wire" suggestions to the dealer as to how he may make use of them for his own benefit.

The Firestone Tire & Rubber Co., of Akron, is publishing a new house organ called "The Firestone." It is a four-page illustrated paper, intended for circulation among the employees in the company's many branches throughout the country and it gives a readable and naturally optimistic account of the various Firestone activities, both commercial and social.

On the occasion of the flag raising ceremonies described on page 620 of the August issue of THE INDIA RUBBER WORLD, the Essex Rubber Co., Inc., of Trenton, New Jersey, distributed an attractive souvenir in the form of a metal medallion three inches in diameter, with a raised brass edge and having in the center, in a raised design, enameled in colors, the seal of the United States. The souvenir evidently is intended for a paper weight and is admirably adapted for this purpose.

A booklet issued by the General Bakelite Co., 100 William street, New York, with the somewhat complicated title of "Oxybenzylmethylenglycolanhydride"—the full chemical name for the condensation product known as Bakelite—contains a description of the distinctive properties of this compound and illustrations of the various products made of it.

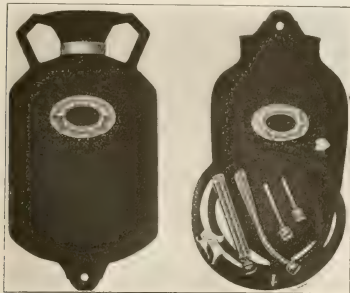
GOVERNMENT REPORTS AS AN AID TO EXPORTERS.

American manufacturers desiring export trade will find much to interest them in "Commerce Reports," a daily publication issued by the United States government. Besides listing the opportunities for the sale of American goods in foreign markets, it gives a complete daily record of the requirements of the United States government, notices of current changes in the tariff and trade-mark laws of foreign countries, and other valuable information. This is a pamphlet of 20 or more pages, the cost of which is \$2.50 per annum.

New Goods and Specialties.

DE LUXE RUBBER GOODS.

THE cuts below illustrate new items just added to one company's line of druggists' sundries. The larger cut shows a "De Luxe" combination water bottle and syringe, and also a fountain syringe, in the "Wearever" quality; on both of which patents have recently been granted. These articles are each



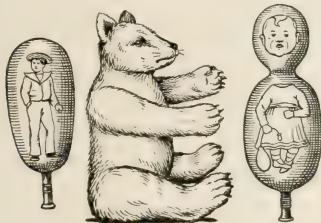
molded in one piece, being made of maroon rubber, with smooth surface. The syringe tubing is of extra large size, in hexagon design, and the four rapid flow pipes accompanying each syringe are threaded for screw attachment to the tube. The conversion of the hot water bottle into a syringe is effected through a combination cap.



The smaller illustration is of the new "Take-a-Part" ear and ulcer syringe, in the same class with which is also a new infant syringe. These are both made with maroon rubber bulbs and with detachable pipes, the former of soft red rubber, and the latter of flexible black rubber. [The Faultless Rubber Co., Ashland, Ohio.]

TOY BALLOONS.

Some new "Eclipse" brand rubber toy balloons are shown in the illustrations below. These balloons are of the squeaker variety and are made of high-grade rubber, in sizes from 16 to 60 inches in circumference when inflated. They are furnished with patent stoppers if desired, for inflation by means

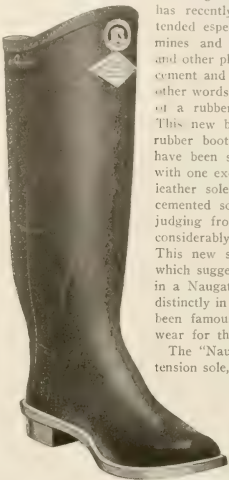


of a bellows. In the "Dying Teddy Bear" class, the company makes also rabbits, chickens, donkeys, cats, etc. The oval balloon is made in various sizes and with a large mouthpiece. The baby squeaker comes in two sizes, either plain or in colors, the line—which includes all kinds of air balloons,

squirts, etc.—being produced in an assortment of beautiful brilliant colorings. [The Rubber Novelties Co., Limited, Knott Mill, Manchester, England.]

A NEW RUBBER BOOT FOR SEVERE SERVICE.

What miners particularly want in rubber boots is the maximum of wear, comfort of course being assumed. A new rubber boot



has recently come on the market intended especially for workers in iron mines and men employed in garages and other places where the floors are of cement and not particularly smooth; in other words, where the wear on the sole of a rubber boot is unusually hard. This new boot is quite similar to the rubber boots with leather soles which have been so popular for many years, with one exception—that in place of the leather sole there is a specially tough cemented sole which the makers say, judging from various tests made, will considerably outwear the leather sole. This new sole is called the "Nauga," which suggests that probably it is made in a Naugatuck factory. If so, that is distinctly in its favor, as Naugatuck has been famous for superior rubber footwear for the last 65 years.

The "Nauga," by the way, is an extension sole, which saves the foot of the boot from any hard knocks. In color it is a chrome yellow. [United States Rubber Co., New York.]

A NEW GOODRICH GASOLINE HOSE.

The great trouble encountered in piping gasoline has been that the fluid dissolves rubber, causing disintegration and thereby allowing small particles of rubber to get into carburetors and cause engine trouble.

With the end in view of rectifying this trouble, a new gasoline hose has been put on the market. The inside rubber tube is protected from the gasoline by a very fine fabric, specially treated, which is held in place by a steel wire. The result is that no matter how much disintegration takes place, no particles of rubber, however small, can get into the gasoline. The wire is a flat steel spiral which covers approximately two-fifths of the surface of the fabric, and prevents kinking of the hose.



The hose comes in two styles, the "Commander" and the

"Goodrich." The latter has a smooth surface and its inner construction differs from that of the former in that the protecting wire is wider than that of the "Commander" brand, which has a corrugated surface. [The B. F. Goodrich Co., Akron, Ohio.]

ELASTIC FABRIC AS A WEIGHT REDUCER.

In certain directions it is quite probable that the use of elastic fabrics is not as general as it was formerly. For instance, whereas a few years ago



women's wear with the intention of reducing unnecessary avoirdupois. Of the three



flesh-reducing garments here shown, durable woven elastic cloth, specially treated to withstand ordinary washing and perspiration, forms the front of the brassiere. The back is of fine batiste. The garment has adjustable shoulder-straps, fastens in front, and may be worn with or without corsets.

"FIRST AID" IODINE AMPUL.

This germ-proof container for tincture of iodine has at one end a rubber covering which connects the glass tube with a cotton brush. To use, break off the hermetically sealed end to admit the air, then break the glass inside the rubber covering by pressing down upon the rubber, thus allowing the iodine to flow through the cotton brush on the injury in need of cauterization. As tincture of iodine is highly evaporative, the rubber answers the double purpose of preventing evaporation and guiding the flow of iodine to the proper outlet. [H. K. Mulford Co., Philadelphia.]

NEW GREASE GUN.

A new grease gun built to hold a gallon of grease and provided with a system for registering the amount discharged at any one time, is equipped with a special type of rubber hose for carrying the grease to the desired point. This hose was chosen for the purpose because of its ability to stand garage conditions. This grease gun is substantial in design, for hard garage use. [John J. Zwald, Emporium, Pennsylvania.]

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

A FEW RAINCOAT FEATURES

The new coat illustrated combines all the latest style features of the dressy models with warmth and storm proof qualities, being



made of heavy rubberized covert cloth. It is now on the market in the fashionable shades of gray and tan. It has a full skirt and raglan sleeves with button-trimmed cuffs. The collar may be worn rolled back in Quaker effect or turned up high around the neck. Such a coat with the collar turned up, and with pockets and vents for the hands—when worn in combination with a hat as illustrated, makes the carrying of an umbrella unnecessary. This hat is made in rubberized material in colors to match the coat, and with the brim turned down protects the face in the severest weather. [Bellas Hess & Co., New York.]

AMONG THE LATEST RIDING HABITS.

Latest showings include some new riding habits, of which two are here reproduced. Both are made of Oxford melton, and another point of similarity is the rubber facing in the coat skirts, one of which is turned back to show this rubber protection. Apart from these features and the breeches, they are dissimilar in style, one costume having a single breasted long coat, while the other, which is on



sale at present only in brown, is a double breasted flare model. [Franklin Simon & Co., New York.]

A RAGLAN RAINCOAT.

The number of men who are accustomed to treat the umbrella with silent neglect, not to say with open disdain, and to look only for protection in times of storm to the raincoat, is constantly increasing. Here is a raincoat with a number of new features. It will be noticed by the illustration that it belongs to the raglan style and that it is single breasted without a fly front. The more novel features lie in the length and width of the lapels and also in the extra stitching at the cuffs and around the pocket flaps. This coat is made of tan colored cashmere, double texture, and guaranteed to be waterproof. It is also made with an extra full skirt. [A. G.



Spalding & Bros., 520 Fifth avenue, New York.]

SIX NEW OUTING SHOES

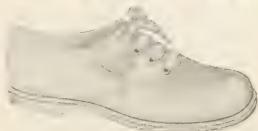
There is no other department of rubber footwear which has shown during the last few years such development and expansion as the manufacture of outing and tennis shoes.



VARSITY OXFORD.



RAMBLER OXFORD.



ROVER OXFORD.

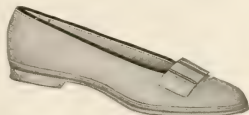
The outing has become much more of an institution of late years than it was formerly. A considerable portion of the American public now devotes itself quite continuously to the

resembles the "Varsity," but is made only in misses' and children's sizes, and in order to please juvenile tastes, can be had in golden glow duck with red soles, if so desired.

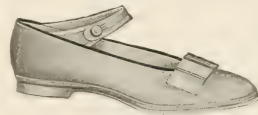
Among the new outing shoes offered this fall are the



VERANDA PUMP BLACK DUCK WITH WHITE SOLE.



VERANDA PUMP WHITE DUCK WITH BLACK TRIMMING.



VERANDA PUMP WHITE DUCK WITH STRAP.

outing, locating it during the summer months along the New England coast, and transferring it during the winter months to Florida, Southern California and other semi-tropical climes. It is quite natural, therefore, that the paraphernalia for those who give themselves over to outings should increase in extent and variety.

The latest catalogs of "outing shoes" show six new varieties not hitherto offered the public. Briefly described and illustrated they are as follows:

First is the "Varsity," a white duck shoe made with a welt and having a white rubber sole with wedge heel. This shoe is intended for both men and women and is made in both "Oxfords" and "Bals." The "Rambler" is quite similar to the "Varsity" in its general appearance and construction except that it has a full heel instead of a wedge heel. The "Rover"

effects being an obvious concession to the prevailing tastes at the present time for multi-colored footwear.

Another "Veranda" pump for women is made of white duck and white rubber, with black trimming around the edge of the upper, and provided with a strap. A better idea of these various shoes can be obtained from the accompanying illustrations.

A new last has also been introduced this year in outing shoes for children, called the "Nature" last. The accompanying cut showing the forward half of one of these shoes, viewed from above, gives a very good idea of its natural lines and comfortableness. [United States Rubber Co., New York.]



NATURE LAST

CORD TIRES FOR AEROPLANES.

Resiliency and security against "blow outs" are important factors in aeroplane tire building, while large tire section diameter is necessary to provide maximum cushioning qualities. The superior resiliency of cord tires has long been recognized, and the success achieved by tires of this type in automobile track races demonstrates the fact that they rarely "blow out."

The illustration shows a new Goodyear aeroplane cord tire. It is the 26 x 4 regular clincher which contains from four to six cord layers, insuring extreme reinforcement. [The Goodyear Tire & Rubber Co., Akron, Ohio.]



THE "SKUDDER CAR."

An interesting new mechanical vehicle for children from 3 to 12 years old is called the "Skudder Car." It can be propelled at a speed of 10 miles per hour on smooth pavements by the rider. It is provided with ball bearings and solid rubber tires. [The Skudder Co., Straus Building, Chicago.]

EVERY MAN HIS OWN HAIR TRIMMER.

Every man who has entered a barber shop for the purpose of securing a plain and simple haircut and has been interrogated by the industrious barber as to whether he did not want in addition a shampoo, dry or wet; electric massage, an eyebrow trim and an alcohol rub will be glad to learn that if he so elects he can from now on trim his own hair in the quiet and solitude of his own home. An inventive genius, obviously a



friend of all mankind, has devised a simple and inexpensive apparatus which enables the owner to do his own hair trimming when and where he will. It consists of a hard rubber comb to which safety blades are attached. These blades can be adjusted in such a way that the hair may be trimmed long or short, as desired, or one part of it trimmed long and the other part trimmed short. In addition to saving the time wasted while waiting for "Next," this little instrument is obviously a saver of expense. [American Safety Hair Cutter Co., Pittsburgh, Pennsylvania.]

The Rubber Trade Association of New York Adopts New Rules.

THE following rules governing crude rubber contracts, recently adopted by The Rubber Trade Association of New York, constitute such an important step in the history of rubber importing as to be well worth reproducing in full.

RULES.

All sales by private treaty, purporting to be made subject to the Rules of the Rubber Trade Association of New York, shall be considered as made subject to the following Rules:

STANDARD QUALITIES.

1. Plantation Standards consisting of *Hevea* Thick and Thin Pale Plantation Crepe, *Hevea* First Latex Crepe, *Hevea* Ribbed or Plain Smoked Sheets, Unsmoked Sheets and (or) Biscuits, to be as understood in London and (or) New York; Para Standards—To be as understood in New York.

INFERIOR QUALITY.

2. Where a parcel of rubber is sold under one of the standard descriptions for a specified shipment, arrival, delivery or on the spot and finally found inferior, buyer shall have the option of rejection and the quantity so rejected, whether the whole or any portion, shall not constitute a delivery on the contract. Should the time for delivery have expired the seller shall have three (3) clear working days to replace the quantity rejected provided that such quantity was, in the opinion of the arbitrators, a *bona fide* tender, otherwise Rule 11 to apply.

3. Where a parcel of rubber is sold with a description of quality other than specified in Rule 2, and upon delivery is found inferior, or any portion is found inferior, then the buyer must accept the same with an allowance, provided such allowance, in the opinion of the arbitrators, be not more than two cents (2c.) per pound or otherwise as may be specified in the contract; but should the parcel, or any portion tendered, be rejected the seller to have the option (provided that it was in the opinion of the arbitrators a *bona fide* tender) of substituting guaranteed quality on the spot to fulfill his contract within three (3) clear working days or the expiration of time for delivery as the case may be, otherwise Rule 11 to apply.

DELIVERY WEIGHTS.

4. The words "about" or "more or less," when used to define quantities contracted for, shall mean the nearest amount which sellers can fairly and reasonably deliver, but no excess or deficiency shall be greater than 2½ per cent. The word "ton" shall mean a ton of 2,240 pounds.

5. Final delivery on any contract to be within 100 pounds of the weight contracted for, but in any case the nearest weight of the contract quantity that the average weight of the packages of the final tender admits. But where it is found impossible to deliver within 100 pounds, taking the average weight of the packages tendered, any deficiency, or excess, shall be invoiced or invoiced back, as the case may be, at the market price on the date of delivery. Should buyer and seller fail to agree on the market valuation at such time same is to be fixed, without fee, by the arbitration committee.

6. Buyers shall have the option of rejecting any tender of less than 2,000 pounds, except in completion of a contract; but tenders of less than 2,000 pounds may be combined provided rubber so tendered is in the same neighborhood.

DECLARATION OF VESSELS.

7. After declaration should the vessel, or vessels, carrying any portion of a contract calling for shipment be lost, such contract is to be cancelled to the extent of the goods lost. Should the shipment not be declared by the seller prior to the loss of the vessel carrying the shipment, such loss shall not vitiate the contract or any part thereof.

PROMPT SHIPMENT.

8. The term "prompt shipment" from foreign ports shall, under normal conditions, be considered as follows: Within a period of fifteen (15) days if shipped from the Great Britain or Europe, thirty (30) days if shipped from the Far East, thirty (30) days if shipped from the Amazon Valley.

TENDERS.

9. Plantation grades when tendered to the buyers shall be taken within three (3) clear working days; all other grades

within two (2) clear working days. The tender to be received by the first buyer before 3.30 p. m. (11.30 a. m. on Saturdays), and the first and each subsequent buyer must pass same on with due despatch, but in any case within one (1) hour of receipt. Tenders received between 1 p. m. and 2 p. m. must be received by the next buyer before 3 p. m., but in no case later than 5 p. m. on the last working day of the period of delivery (1 p. m. on Saturdays). For the purpose of this rule a day is to be taken as commencing at 10 a. m. and ending 5 p. m. (Saturdays 1 p. m.). Any party failing to re-tender within the times specified as above becomes a first seller.

10. It shall be considered a proper tender when rubber is discharged from steamer and (or) ready for delivery.

DEFAULT.

11. Wherever it may be admitted by the seller, or decided by arbitration, that the seller has failed to fulfill the terms of the contract, the buyer shall close by invoicing back the rubber to the seller at once at a price and weight to be fixed by arbitration, which price shall not be less than 2 per cent. and not more than 10 per cent. over the estimated market value of the shipment contracted for on the day upon which the default occurs, the difference to be due in cash in ten (10) days.

EXAMINATION AND ACCEPTANCE.

12. Buyer shall be afforded full opportunity, by the seller, of examining rubber on the dock or at warehouse, and once delivery is taken it constitutes final acceptance. All risk after weighing for account of buyer. Delivery shall be considered completed after rubber has passed the weighmaster's scales and weights ex-dock or ex-warehouse to be final.

WEIGHING AND TARING.

13. Unless otherwise stated in the contract all tenders of plantation rubber or rubber in bales may be weighed in drafts at the option of the seller. Rubber shall be weighed gross to the 1 pound, if in drafts, and may be weighed to the ½ pound, if weighed by the package. Cases tared shall be weighed to the ½ pound. Paras shall be grossed and tared case by case to the 1 pound. All other grades of rubber which cannot be readily tared are to be billed at tares guaranteed by seller.

PLANTATION TARES.

14. Plantation tares shall be ascertained by taring 10 per cent. of each lot (but in no case less than 3 cases) and adjustment made on the basis of shrinkage or gain as compared with the marked tares. Weighmaster is to furnish weight returns or marked tares. Where no official weights or marked tares are available all cases are to be tared. If either party, buyer or seller, desires to have any quantity in excess of 10 per cent. of the delivery tared, it shall be at the expense of the party demanding same.

MONTHLY DELIVERY CONTRACTS.

15. Where a contract calls for monthly delivery or shipment, each month or specified part of a month's delivery or shipment is to be treated as a separate contract.

OPTION OF DELIVERIES.

16. Where rubber is sold for shipment from a foreign port, the seller may tender in fulfillment of the contract, rubber not coming from that port, provided it is of the same description and quality as the rubber named in the contract and is tendered according to the terms of the contract so far as the time and place of delivery are concerned.

ARBITRATION ON IDENTICAL CONTRACTS.

17. When the subject matter and terms of contracts are identical, or identical except as to date and price, all arbitrations shall be held as between first seller and last buyer as though they were contracting parties, and the award made in pursuance thereof, subject to the right of appeal to the committee of the association, shall be binding on all intermediate parties, providing that the terms of the contract have been fully fulfilled.

NOTIFICATION OF REJECTIONS.

18. If acceptance of any parcel of rubber is refused by a buyer, immediate notification must be given the seller, same to be supplemented in writing within 24 hours, stating specific reasons for such refusal.

SPECIAL AGREEMENTS.

19. Any special agreement expressed in a contract supercedes the rule to the extent said rule is affected thereby.

FORCE MAJEURE.

20. Should shipments or deliveries be prevented during the period stipulated in a contract by reason of war, riots, strikes, government embargoes or other force majeure causes, the time allowed for shipments or deliveries shall be extended until the operation of the causes preventing shipments or deliveries has ceased.

TERMS OF PAYMENT.

21. Terms of Payment: Cash on delivery less 10 days' interest at the rate of 6 per cent. per annum.

22. These rules shall govern all contracts made on or after July 15, 1915.

REMINISCENCES.

By a Veteran Rubber Factory Superintendent.

SOME years ago a rubber shoe manufacturing firm was troubled with blistered shoes. After they had tried every way they could think of to stop it I was asked to come and see if I could find the cause. Soon after my arrival I went into the compounding room, and running my hand down in the whitening box I found the whitening damp from a leaking steam pipe. The pipe was repaired and the blisters stopped.

At a large shoe factory I found the soling calender rolls running even motion, with a man behind each machine pushing the stock in to keep it off the floor. The machines were changed to slip motion and the men taken away. These machines had run wrong for 50 years.

This factory was making as high as 16 per cent. "seconds." In two months the proportion was reduced to one-quarter of 1 per cent. Then I was called in the office and told that customers were finding fault because they were not getting enough seconds. It had been the rule to put so many seconds in every case of first quality.

In fitting out a new factory the upper and soling calenders were placed in opposite position to that intended. The reason was to keep the men from getting caught in the rolls at the top; and I have always thought they turned out better work.

It has been a matter of wonder to me in going from one factory to another to find how tenaciously manufacturers hold to a wrong idea rather than have an outsider tell them of something better. It is false pride with many of them.

In one place they were boiling oil for varnish 30 days and nights, when the boiling was stopped and varnish made without boiling the oil. They figured that this had cost them a lot of money. One factory had the idea that all compounds must be tumbled about in a rolling barrel, without any thought about cleaning or taking out all the compounds. The barrel was finally put on the dump, and then the goods took on a better appearance.

When starting a new mill, a branch of another some miles away, I sent to the old factory for thermometers to test the heaters. Putting in a few shoes, the heat was run along regular lines, but I found the shoes were not vulcanized, so I tried again, and the same thing happened. I was puzzled. Filling a small kettle half full of sulphur I hung it alongside the thermometer. When the sulphur commences to melt the glass ought to stand about 240 degs., but it was 290 degs. Sending word to the manager of the other factory that the thermometers were out 50 degrees, he said they meant to tell me about it—that they were made so on purpose, to mislead the inquisitive. The secrets in rubber mills are not so many as supposed.

In these progressive days, with the many chemists employed, I suppose nothing can go wrong. But good horse sense goes a long way, and sometimes fools the chemist. I have known it to do so many times. After all there is nothing as good as a strong thumb-nail.

As I think of the many experiences during forty or more

years in rubber mills I wonder if those engaged in the business today are having troubles of their own.

In all the years I was engaged in the rubber business the one thought uppermost in the mind of the management was that the opposition was doing better work at less cost; that the other factory was more up-to-date, and that if they could get the secret they would be better able to compete.

It occasionally happened that I went with some of these competitors. One instance is most prominent in my mind. For several years I had heard about the wonderful shoes this concern was making, the brilliant luster of the varnish, the up-to-date styles; in fact the praises were sung on about everything connected with the boots and shoes of this company.

Now, what was the truth? Three months after leaving this factory I was superintendent of the other. When talking with the manager about taking the position, he said that for many years they had ignored the shoes of the first firm as of no account, and that they cut no figure in the market, but now their customers were asking why they did not turn out as good shoes. He also said that on examination he found them superior to their own. In one month after I joined the new plant about every formula was changed to a cheaper and better, with the cost cut in two in many cases, and the number of formulae cut from 80 to 20. The ticket had been going down for some time. It immediately went from 8,000 to 16,000 pairs a day.

My experience in different factories teaches me that most of them carry altogether too much mixed stock, considering the money invested, the room it takes, deterioration, liability to contamination, etc. Does anyone believe that he gets the same results from materials after lying for weeks in the stockroom that he gets when they are first mixed? I am not a believer in throwing stock from mixing mill into calender, but I have found stock better after two or three days.

In taking charge of a small factory I found several tons of mixed stock, also a good-sized building full of clippings and other cloth scraps. In a few months this was all utilized in the factory, not one pound wasted, and this factory—which had just kept its head above water for three years—made 150 per cent. the first year.

My way was to compound up or down as required to make a stock suitable for a desired purpose, instead of mixing new stock and probably having some to put away. A good deal of the above applies only to those who do a general rubber business.

In one place I found many dollars' worth of varnish in barrels and cans lying about the yard and out-buildings. The varnish had been made at different times, each maker thinking he knew the trick but having failed. Some made it with blown oil after Weber's formula, some with Baltic oil, Calcutta or any old oil that came to hand. This was all *reclaimed* (excuse me for using this word), and every gill of it used in the regular way, and came out all right.

This reminds me of a man who at one time was well known to the trade. When he first came under my notice he was running a factory making tan shoes vulcanized with steam heat. These I understood found their way back to the factory. Afterwards he had a small experimental shop back of his house. One day he came to the factory where I was employed, and as I had visited him at his home I did my best to show him everything of interest in the factory. When he was passing out the office door he remarked that it was wonderful. I asked him just what he meant. Why, he said, it was wonderful how well my employer had got along for one who knew so little.

Which shows how little effect failure has in taking the conceit out of a man.

"Rubber Machinery." Mr. Pearson's newest book, filled with valuable information for rubber manufacturers, is now ready for mailing. Price, \$6.

New Machines and Appliances.

A NEW BIAS CUTTING MACHINE.

GORDON'S machine constitutes an improvement in bias-cutting machines and particularly to those machines adapted for cutting very wide sheets of rubber cloth.

Referring to the illustration, in which like letters indicate like parts in both drawings—*I* designates the side frames, *B* the roll of frictioned fabric, *C* the fabric, and *D* the liner roller. The fabric is passed over roller *E*, down and around roller *F*, and over roller *G*, all being positively driven from the belt pulley *H* by spur and chain gearing.

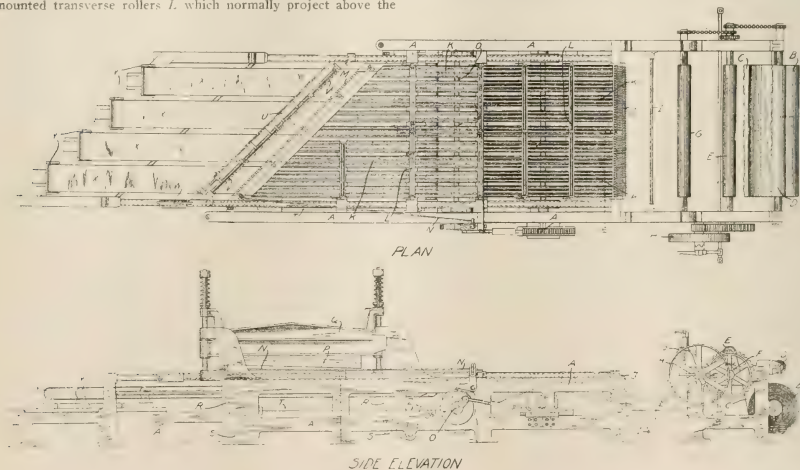
From the roller *G* the fabric passes down and under a weighted roller *I* and then over the fabric guide *J* to the table. The guide *J* consists of bent fingers, one set inclined to the right and the other toward the left. Their forward ends are connected with a slide operated by a hand rod by which the fingers are adjusted.

The surface of the table is formed by a series of ribbed plates *K* which are interrupted at intervals by spaces in which are mounted transverse rollers *L* which normally project above the

is the same and the bridge is lifted evenly. The cutting is done by the downward stroke of the bridge and shear.

In front of the table is a carriage *C*, projecting beyond the rear edge of which is a series of lower gripper fingers arranged in line, with clearance notches. Co-acting with these lower fingers is a corresponding series of upper fingers or grippers *V* which are connected with a rock shaft mounted in bearings on the ends of the carriage. Secured to the rock shaft is a series of rearwardly extending arms beneath which springs are placed to force the grippers together. As the carriage moves toward the cutters, the grippers are open, but when the grippers have passed on the raising plate they are released by a lug striking a stop which closes the grippers, just as the fingers enter the notches in the raising-plate and while the bridge is raised. The grippers come together to grip the edge of the fabric which has been lifted from the lower knife by the raising plate, the edge of the fabric being in line with and caught by the grippers.

Adjustably mounted on one of the tubular bearings is a cam



plane of the table. These rollers are mounted so that they can be dropped below the plane of the table.

At the forward end of the table is a lower knife *M* which extends diagonally across the frame at an angle of 45 degrees. Above this knife is a transverse plate that is raised and lowered by rod *N*, a bell-crank lever, and a cam, driven from the main shaft *O*. Above the plate is a strip of card cloth beneath which the fabric passes and which prevents the fabric from creeping backwards while permitting it to be drawn forward. Co-acting with the lower shear *M* is a movable upper shear *P*, which is fixed to the bridge *Q*. The bridge and shear are raised by vertical rods *R*, *R*, connected to bell crank levers *S*, *S*. The front lever *S* is connected by the rod *T* to a lever that is rocked by an eccentric attached to the main shaft *O*. The opposite lever *S* is connected by a short rod to a similar lever and eccentric on the same shaft so that the movement imparted to the rods *R*, *R*

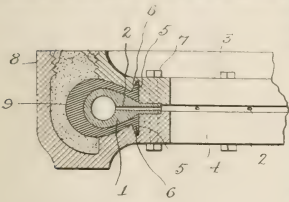
W which determines the extent to which the fabric is drawn forward before the cutting takes place, and on the end of the rock-shaft is an arm which engages with this cam to open the gripper fingers. As the carriage moves forward the grippers are opened and the strip of fabric released, the machine being timed so that the cutter descends when the carriage reaches the limit of its forward movement. The severed portion of the fabric drops on aprons *X* driven from a roller and running over adjustable rollers *Y* at the forward end of the machine.

With this machine the fabric is drawn on the table and spread out flat and any tendency to creep to one side is overcome by the warp fingers. If the fabric creeps to one side or the other, by manipulating the fingers which spread the fabric toward opposite sides its course may be properly directed through the machine. [William A. Gordon, assignor to Birmingham Iron Foundry, United States patent No. 1,148,162.]

ADAMSON'S TREAD MOLD

Tire treads are usually vulcanized either in two-part molds or wrapped with strips of cotton cloth. In the former method the gases in the compound are sometimes trapped, causing blisters; while cloth wrapping is expensive.

Adamson's mold provides a support of powdered soapstone or molder's sand, which surrounds the tread surface of the casing, and holds it in shape while the gases are free to escape.



Referring to the drawing: 1 is a metal core on which the casing is built up, and which is hollow to permit access of steam through openings 2. The upper and lower mold sections 3 and 4 respectively have channels 5, which form the beads 6, the sections being clamped together by bolts 7. The lower mold section 4 is extended annularly at 8, forming a circular channel that surrounds the tread surface 9.

In practice the built-up tire shoe is placed between the sections 3 and 4, which are then clamped together. This shapes the beads as well as the body of the shoe in the usual manner. The pocket formed by the extensions of the molds is then filled with molder's sand, which is tamped, in the usual manner, and brought flush with the upper edges of the extensions, when the mold is ready for the vulcanizer. The sand surrounding the tread surface of the shoe will maintain the rubber stock—softened by the rise in temperature—against movement, while it also permits the escape of any gases liberated in the rubber. [C. F. Adamson, assignor to United States Rubber Co., United States Patent No. 1,150,922.]

OTHER INVENTIONS.

Raymond B. Price has recently been granted five patents covering processes of vulcanization and methods of making rubber thread and other vulcanized products. Brief descriptions follow:

VULCANIZATION WITH A FLUID MEDIUM.—Tires, hose, boots and shoes are vulcanized in a bath of calcium chloride or other heat transmitting mediums of a fluid nature under the vulcanizing temperature. [United States patent No. 1,152,834.]

VULCANIZATION WITH A FLUID MEDIUM UNDER PRESSURE.—The article to be vulcanized is surrounded with a heating medium and the latter subjected to pressure. [United States patent No. 1,152,835.]

VULCANIZING FABRIC AND RUBBER.—A layer or layers of fabric are interposed between layers of rubber such as in hose or tires. The fabric layer is first subjected to fluid pressure and then a greater pressure is applied to the exterior rubber layers. This removes the moisture and compacts the layers of fabric and rubber. [United States patent No. 1,152,836.]

WARMING, PRE-HEATING, AND VULCANIZING PROCESS.—Boots and shoes are treated to a preliminary warming at or under atmospheric pressure, then to a pre-heating at a temperature above the curing heat and at a pressure above, at, or below atmosphere, and finally they are vulcanized. [United States patent No. 1,152,837.]

MAKING RUBBER THREAD.—A number of superimposed layers of rubber sheet are coated with a medium, such as glycerine, that is liquid at the vulcanizing temperature and the pile is then vulcanized. The coating of glycerine prevents the layers from adhering so that they can be separated after vulcanizing. [United States patent No. 1,152,838.]

EXTRACTION OF BENZINE FROM RUBBER.—The air space above or surrounding a proofed fabric from which solvent is being evaporated is completely enclosed, and facilities are provided for inspecting the fabric after passing the spreading knife. The vapor of the solvent is recovered in a closed system in which the vapor-laden air is drawn by a fan from the drying chamber through two refrigerators for condensation; the residual air being reheated and passing again into the drying chamber. [E. Bataille, French patent No. 474,003—1914.]

A NEW WATERPROOF FABRIC AND PROCESS OF MANUFACTURE.—The inventor uses loose staple cotton, hair or threads distributed in thin layers, the fibers of one or more layers being angularly disposed to the fibers of the adjacent layers. When a sufficient number of layers have been piled together they are submerged in a solution of rubber. After the excess rubber has been pressed out the material is sheeted.

The claim is made that tires made up of this material are non-skid and puncture proof, and that rubber heels of the material wear longer and will not slip on wet pavements. [Hazen Swain, United States patent No. 1,152,349.]

MANUFACTURE OF SEAMLESS GOODS.—Gloves, nipples, finger cots, tobacco pouches, etc., are made by dipping. A recent invention covers a process which consists in dipping and vulcanizing separately each successive layer of rubber. The layers may be of different rubbers and consistency, and in making gloves, nipples and finger cots the bead at the open end is formed before curing by rolling up the layers. [Thomas W. Miller, assignor to The Faultless Rubber Co., United States patent No. 1,152,372.]

THE GARDNER VALVE PACKING GRINDER

Hard rubber valves must be accurately finished to be serviceable—that is, the two opposite sides of the ring should be ground flat and parallel to within two thousandths of an inch. Also rings of the same size should not vary in thickness more than five thousandths of an inch.

The Gardner machine is used for grinding at the same time two parallel sides of a valve or ring. The two abrasive discs are mounted on



placed heads driven by independent belts. The right hand head is fixed and the one on the left is moved laterally by a rack and gear operated by a hand or foot lever. A micrometer stop screw, graduated in thousandths of an inch, regulates the forward travel of the head so that duplicate work can be finished accurately.

In the illustration the grinder is shown in operation finishing, one at a time, valves of six different sizes. These are clamped in a simple wooden holder and held between the revolving discs by the right hand of the operator. The movable head and grinding disc is brought up against the valve by a lever operated by the left hand of the operator.

With the larger valve rings, a roughing cut is first made with coarse discs to bring the ring down to within 12 thousandths of finished size. Finer discs are then substituted and the finishing cut made bringing the valves down to size. The output is 600 to 625 of the small valves per hour, as only one cut is required, and 350 to 370 of the larger valves per hour, as two cuts are required. [Gardner Machine Co., Beloit, Wisconsin.]

THE SILENT CHAIN DRIVE.

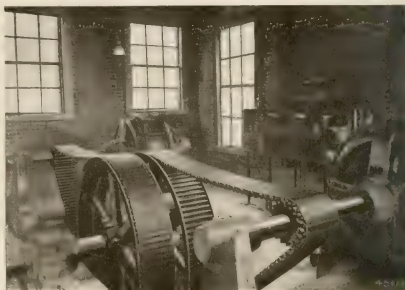
The introduction of electric drives in the most progressive rubber mills has greatly changed the appearance of factory interiors. The unsightly line and countershafts with whirling pulleys and flying belts are gone. While this is primarily due to the motor drive, it is the application of the chain drive that makes this transformation complete.

The silent chain consists of stamped links pivoted together forming a multiple chain that is as flexible as a belt and as positive as a gear. Both the drive and driven gears are accurately cut to fit the chain. Transmission service in rubber mills is very severe. As a matter of fact gearing has heretofore been used almost exclusively, but the repair and maintenance costs due to the gears transmitting shock, have in many cases caused the substitution of chain drives.

For heavy intermittent service, such as driving washers, mixers or grinders, where the load often varies from 25 per cent. to 150 per cent. within a few seconds, the chain drive is very satisfactory. When applied to calenders the driving force is positive but elastic and is equal at each instant to the uneven load usually carried by these machines. The chain drive is particularly well fitted for driving textile machinery, such as hose braiders, looms and special tire fabric machines. The smooth drive and even turning of rotating parts result in fewer broken threads. It is peculiarly fitted for the operation of air compressors, positive pressure blowers, and similar machinery, and for driving ventilating and heating fans. The silent chain permits of compact construction and requires but a minimum of attention.

The service cost per horse-power of a chain drive is probably lower than any gear, rope or belt transmission, tests on small

Chain drive—1,200 horse-power drive, 240 to 80 r. p. m., 100 in. centers; one 31-tooth sprocket, driver 30.21 in. diameter; one 93-tooth sprocket, driven 89.42 in. diameter; 33.5 ft. x 31 in. x 31 in. silent chain—price, not including balance wheel, \$3,748.75.

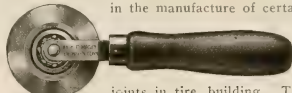


TWO 200-H. P. LINK-BELT SILENT CHAIN DRIVES. OPERATING LINE SHAFTS FOR RUBBER MILLS. SIZE OF CHAIN: 2-INCH PITCH BY 12-INCH WIDE.

The chain drive is now used to transmit power to many rubber machines. A total of over 33,000 horse-power in service in rubber mills shows the popularity of this type of power transmission.

A NEW STITCHER.

The hand stitcher is not only a very simple tool, but is an extremely useful one. In fact it is almost indispensable in the manufacture of certain goods; for instance, in rolling down the fabric strips and making smooth joints in tire building. The usefulness of this tool has greatly increased recently, and has resulted in the development of an improved ball bearing stitcher, which is made by the Hoggson & Pettis Mfg. Co., New Haven, Connecticut.

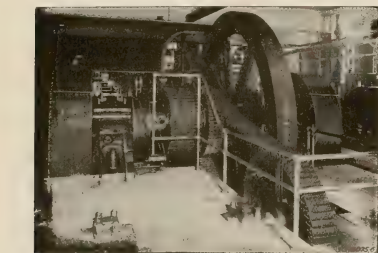


A NEW HOSE COUPLING.

This device does away with hose clamps, straps and couplings that require special fastening tools when attaching hose to a threaded terminal. The end of the hose is slipped into the corrugated end of the socket, which is then screwed on



the threaded sleeve. This is provided with a long taper which expands the hose against the corrugated socket, holding it in a positive grip. No special tools are required to make or break the connection, as ordinary wrenches are sufficient for the purpose. [The National Hose Coupling Co., Peoples Gas Building, Chicago.]



1,000-H. P. and 500-H. P. MORSE SILENT CHAIN DRIVES, OPERATING TWO LINE SHAFTS IN A LARGE RUBBER MILL. SIZE OF CHAINS: 3-INCH PITCH X 24 INCHES WIDE AND 3-INCH PITCH X 12 INCHES WIDE, RESPECTIVELY.

powers having shown that this efficiency runs from 98½ to 99 per cent.

The following comparison is a good example of the greater compactness of this modern power transmission.

Rope drive—1,200 horse-power, 240 to 80 r. p. m., 42 ft. centers; diameter of driving sheave, 6 ft. 4½ in.; diameter of driven sheave, 20 ft.; 30 ropes, each 1¼ in. in diameter—price, including balance wheel weighing 120,000 lbs., \$6,900.

In the August number of THE INDIA RUBBER WORLD there was shown a very interesting "permanent set" testing machine used in the laboratory of the New York Insulated Wire Co. The invention was credited to M. M. Kahn, of the laboratory staff, but Mr. Kahn writes us that it was not his invention and we therefore gladly correct the error.

The Obituary Record.

A. G. SPALDING.

While Albert G. Spalding, who died September 9 at his home in Point Loma, Southern California, after a brief illness of ten days, had been a rubber manufacturer for many years, he had been prominent in many other relations and probably was most widely known through his association with athletics in this country, and especially through his connection with the "national game" of baseball. He was a man of marked versatility and



A. G. SPALDING.

was eminently successful, in his younger days in sports, and in his maturer years in mercantile and manufacturing pursuits, while he barely missed conspicuous success in politics.

Mr. Spalding was born in Byron, Illinois, September 2, 1850. He came of excellent American lineage, his first ancestor in this country being Edward Spalding, who settled in Massachusetts in 1630.

Young Spalding left school at the age of 15 to become a grocer's clerk at a salary of \$5 per week. His remarkable skill

in the game of baseball, then beginning to gain wide popularity through the country, soon weaned him away, however, from weighing sugar and delivering sacks of flour. He held the position of pitcher on several local nines, though still giving the major part of his time to more serious mercantile affairs. But in 1871 he was offered the position of pitcher on the Boston "Red Stockings"—the most famous ball team of its day—and he pitched that team to a championship four years in succession; in '76 going to the Chicago National team, which in turn became the champion nine because of his extraordinary work in the box. He remained with the Chicago club only two years, when he retired as an active player, though he remained as manager and secretary.

In the meantime, in '76, with his brother, James W. Spalding, he founded the house of A. G. Spalding & Bro., a firm that grew with great rapidity, establishing branches in all the chief cities of the United States and in Europe and becoming famous all over the world. In connection with the distributing business carried on by this firm a factory was started a number of years ago at Chicopee, Massachusetts, for the manufacture of baseballs, tennis balls and, later, of golf balls.

Mr. Spalding, notwithstanding his large mercantile interests, could not entirely divorce himself from the national game. In 1881 he became president of the Chicago National Club and seven years later, carrying out a plan which he had long entertained in his mind, he took the Chicago team and another, called the "All-Americans," on a tour around the world. As baseball was an unknown game to many of the people in Europe and farther east, this tour of the two famous American nines created

a decided sensation. He retired from active baseball management in 1891.

In 1899 Mr. Spalding brought about the merger of 150 bicycle manufacturing companies into the American Bicycle Co., of which he was the first president. In 1900 he became a resident of Point Loma, California, and a member of the Theosophical colony of that place. In 1910, when the first election was held in California under the primary law which had just been passed, he was persuaded by his friends to enter the contest for United States senator. He carried 75 out of 130 legislative districts, but, notwithstanding that fact, the legislature declared for another candidate.

Mr. Spalding was married twice, his first wife being Miss Sarah J. Keith, of Campello, Massachusetts, who died in 1899. His second wife was Mrs. Elizabeth Churchill Mayer, of Point Loma, who with two sons, Albert G. Spalding, Jr., and Keith Spalding, and an adopted son, Durand Churchill, survives him.

MILTON T. BAILEY.

Milton T. Bailey, for the last 28 years connected with the Apsley Rubber Co. and for a number of years past its secretary, died September 11 at the Massachusetts General Hospital, Boston, after an illness of several weeks.

Mr. Bailey left his home in Hudson August 3 to go to his summer home in West Southport, Maine. He was taken ill immediately on reaching that place. For two weeks his condition was considered very serious, but during the third week he seemed to improve and on September 9 started for home. The trip from the Maine coast to Boston proved to be exceptionally rough and Mr. Bailey suffered several heart attacks. On reaching Boston he was taken to the hospital, where he died the next morning.



M. T. BAILEY.

Mr. Bailey was born in Milan, Ohio, May 8, 1843. He went to school in Pennsylvania and though still under age at the time of the Civil War enlisted as a sergeant with the 143rd Pennsylvania Infantry.

He saw the hardest imaginable service, going through the horrors of both Libby and Andersonville prisons. At the conclusion of the war he became a bookkeeper for William Apsley in Pennsylvania and in '87 transferred his services to the Apsley Rubber Co., Hudson, Massachusetts, first being a bookkeeper, later financial manager, and during the last ten or twelve years of his life, the secretary of that corporation.

He was a man of the greatest conscientiousness and was highly regarded by all his associates. In addition to his business duties, which were engrossing, he found time for many local interests. He was a member of the G. A. R., of the Odd

Fellows, president of the Anti-Saloon League of his town, prominent in the work of securing a public library for Hudson, and the founder of the First Congregational Church of that place, holding important offices in it for many years. During the funeral services, which were held in the Congregational Church, the flag on the Apsley factory and the flag on the Town Hall were at half mast.

EVERETT G. EBERHART.

EVERETT G. EBERHART, vice president and general manager of the Mishawaka Woolen Manufacturing Co., Mishawaka, Indiana, died August 17 in his forty-eighth year, having been born in Mishawaka March 19, 1868.

He was the youngest son of Adolphus Eberhart, who, with the late M. B. Beiger, organized the Mishawaka company for the manufacture of the all-knit boot, which they originated. After his graduation from the high school of his native town in 1887, Mr. Eberhart immediately entered his father's factory and worked in various departments so as to acquire a general knowledge of the industry. Later he was transferred to the office, and in 1903 was made vice-president and general manager, positions which he occupied until his death.

During the 28 years of Mr. Eberhart's connection with the Mishawaka company it increased from a small organization of 200 employees making a yearly product of \$500,000 in value, to a large corporation employing 2,700 people and producing a yearly output to the value of \$10,000,000. And it is the consensus of opinion among Mr. Eberhart's associates that this pronounced success was in no small measure due to his sound judgment and initiative.

WILLIAM R. POPE.

William Ripley Pope, electrical engineer of the National Conduit & Cable Co., of Hastings, New York, died at his home in that village September 16 of apoplexy. Mr. Pope was born September 9, 1856, at Lake Roland, Maryland. He came to New York in 1889, and had been connected with the Cable company for a number of years. He was for twelve years one of the village trustees of Hastings and was the founder of the Hastings Building & Loan Association. He is survived by his wife and a daughter, Mrs. George E. Townsend.

MATTHEW HAMILTON GRAY.

Matthew Hamilton Gray, formerly engineer-in-chief of the India Rubber, Gutta Percha & Telegraph Works, Limited, Silvertown, London, England, passed away at Glenquich, Perthshire, Scotland, September 2, at the age of 61 years, having been born in June, 1854, at Glasgow, Scotland.

Mr. Gray was a brother of Robert Kaye Gray, the late managing director of the Silvertown works, and a member of one of the most famous families in the telegraph, electrical and rubber industries. He was educated to be a mining engineer and to perfect his knowledge he traveled around the world, visiting the United States, South America and the Far East. He returned to England and, following his father's advice, entered the services of the Silvertown works in the capacity of assistant engineer. He played an important part in the laying of cables in Mexico, Central and South America, and from England to Spain. He managed the laying of the Spanish National Cable from Cadiz to the Canaries, and he connected Brazil with Africa.

He retired from the active service of the Silvertown works about seven years ago, but up to his death he continued to interest himself in the various operations of that company.

MRS. CHARLES H. ARNOLD.

For more than thirty years, Charles H. Arnold has been a prominent figure in the rubber trade. Not only is he well known, but many have visited his fine estate in Stoneham and met its capable and womanly mistress. To all such the news of her sudden death will come as a great shock. For the bereaved husband and sons, whose loss is unmeasurable, the deepest sympathy is extended.

NOTES OF THE TIRE TRADE.

TIRES AT THE TWIN CITIES MOTOR RACES.

Though the day was hot there was little tire trouble at the 500-mile speedway race held at Fort Snelling, Minnesota, September 4. The outside rear tires suffered most from the strain of the race. This is the case in all track races, and it is due to the fact that the outside of the track is always roughest, and that at the turns a great portion of the weight of the cars is thrown on the rear outside wheel. The six cars that finished the race made eighteen tire changes, showing the average tire life in the race to be about 170 miles. The winning Stutz cars used Silvertown cord tires. Tire blow-outs caused the destruction of 11 wheels, of which ten were rear wheels. A few treads were thrown.

A curious feature of the race was that the two winning cars ran neck and neck practically throughout the whole race and one, the winner, changed six tires, whereas the other, which made practically the same average speed, only made three changes.

During the fiscal year ending June 30, 1915, the United States exported automobile tires to the value of \$4,963,270, as compared with \$3,505,267 during the previous fiscal year, showing an increase of \$1,458,003.

THE PERLMAN RIM PATENT SUSTAINED.

The United States District Court for the Southern District of New York has sustained United States patent No. 1,052,270, issued February 4, 1913, to Louis H. Perlman, of New York, and has issued an injunction against the Standard Welding Co., of Cleveland, Ohio. The court further ordered that an accounting be made of the profits, which the defendant company derived from the infringement of the Perlman patent. The demountable rim, subject of the patent sustained by this decision, was perfected by its inventor as far back as 1903. It is supported on a small amount of surface and is capable of ready application and removal, and yet is firmly locked on the fixed rim when in use.

LARGER TIRES

Most of the 1916 models of American built automobiles selling at prices above \$750 are provided with what were formerly known as oversize tires. This makes ample provision for the overloading motor cars are so often subjected to.

A METAL CORD TIRE.

The popular cord tire is receiving a good deal of attention these days and inventors are striving diligently to produce a better or even as good an article without actually infringing on

the original patents. Instead of cotton cords, Mr. Miller, of the Anderson Rubber Works, uses wires that are twisted and wound with friction tape, forming metallic cables.

The tire is built up in the following manner: A strip of friction fabric is first placed on the core. Over this is placed a strip of rubber stock and then a layer of metallic cables is laid



diagonally across the core. On this layer is placed another strip of rubber stock and then another layer of metallic cables is laid diagonally and at an opposite angle to the first; then another strip of rubber stock and a strip of frictioned fabric that extends from bead to bead; and finally the breaker strip and tread are applied. This tire is said to be blow-out proof.

[Charles E. Miller, Anderson, Indiana.]

News of the American Rubber Trade.

PICHER LEAD CO. INCREASES CAPITAL TO FIVE MILLIONS.

THE original capitalization of the Picher Lead Co. was \$100,000, but the assets of the company have increased until their value is approximately \$4,500,000. Consequently the stockholders of the company at a meeting held on September 1, in order to bring the capitalization more nearly into uniformity with the company's real assets, voted to increase the capital stock to \$5,000,000. The corporation still remains a Missouri company.

Of the increased stock all but \$1,000,000 was subscribed and taken by the old stockholders of the corporation, the remainder being held by the company as treasury stock.

DEVELOPMENT OF THE FISK RUBBER CO.

This company began manufacturing operations 17 years ago, starting with bicycle tires. Its progress has been rapid. Today it gives employment to about 3,000 people, with a weekly payroll of \$48,000. The principal product is the Fisk pneumatic tire. The capacity of the plant is 5,000 tires daily and this output is now being realized, and makes the Fisk Company an important factor in tire production. In addition to its large automobile tire output the company also manufactures many bicycle tires and a full line of tire repair accessories.

UNITED MALAYSIAN RUBBER CO. NOT AFFECTED.

A recent issue of the "Sarawak Gazette" published in Sarawak, Borneo, contained a letter written by the Rajah of Sarawak, stating that the United Malaysian Rubber Co., Limited, in London, had been notified that its Jelutong concessions in the Sarawak territory had been cancelled and that all the rights under that concession had ceased.

But when the officials of the company at the New York office were questioned about the matter, they made the following statement: "It is quite true that these concessions have been cancelled, but in the form in which they were interpreted by the Sarawak Government they have been of no use to us, so the cancellation of them does not affect our operations. Our plant at Goebilt is still in operation and will continue. There is no intention of liquidating the company."

RUBBER WORKERS GET SALARY INCREASE.

The Manhattan Rubber Manufacturing Co., of Passaic, New Jersey, posted notices on September 16 to the effect that all employees with the concern from six months to two years would receive a 3 per cent. increase in salaries; those who had worked from two to five years, 5 per cent., and all over five years a 7 per cent. increase. The company employs about 750 hands.

RUBBER COMPANY DIVIDENDS.

The Firestone Tire & Rubber Co., of Akron, Ohio, has declared an extra dividend of 4 per cent. on its common stock, payable October 15.

The Republic Rubber Co., of Youngstown, Ohio, paid on September 1 a dividend of 1 1/4 per cent. on its preferred stock.

Early in September the Canadian Consolidated Rubber Co., Limited, of Montreal, Canada, declared the regular quarterly dividend of 1 1/4 per cent. on the preferred stock, payable September 30, to stock of record September 18.

The Rubber Goods Manufacturing Co. of New Jersey paid, September 15, its sixty-sixth regular quarterly dividend of 1 1/4 per cent. on the preferred stock to stockholders of record September 13.

SEMI-ANNUAL UNITED STATES RUBBER REPORTS.

Complying with a request made by a number of their stockholders, the directors of the United States Rubber Co. have voted to issue semi-annual reports of the company's condition. A request had been made for quarterly reports, but the directors did not think this advisable owing to the very considerable expense involved.

THE SOMERSET RUBBER RECLAIMING WORKS.

The Harmer Rubber Reclaiming Works, of East Millstone, New Jersey, changed their name, October 1, to the Somerset Rubber Reclaiming Works and their headquarters from East Millstone to New Brunswick, New Jersey. There will be no change in the management or the officers, I. Laurie remaining president and A. Marcus secretary and treasurer. The office was moved to New Brunswick, as that city has much better postal facilities than its neighbor, East Millstone.

MR. FORD HAS NOT BOUGHT CONTROL OF THE GOODRICH CO.

Mr. Henry Ford has been very much in the public eye of late and has been extremely active in various directions, but in one respect the rumors of his activities are not well grounded. The report was circulated that he had bought control of The B. F. Goodrich Co. This is most emphatically denied. Mr. Raymond, vice-president of that company, in speaking of this rumor says:

"The B. F. Goodrich Co. has \$60,000,000 of common stock outstanding. To secure control of this class of stock it would be necessary to purchase over \$30,000,000 in the open market. Nowhere near this amount has changed hands recently. Furthermore, I feel that if Mr. Ford desired to secure control of the Goodrich company he is the sort of man who would come to us and deal directly with us. Control of the Goodrich company is now in the same hands as at the time of its formation—by that I mean it is in the hands of the Goodrich family, with Mr. Work and others who were the prior holders of control."

TWO RUBBER MEN ON SECRETARY DANIELS' BOARD.

Among the twenty-two men representing eleven different scientific associations appointed, September 12, by Secretary Daniels as members of the Naval Advisory Board, there are two men well known to the rubber trade. One is Thomas Robins, of Stamford, Connecticut, who is one of the representatives of the Inventor's Guild. Mr. Robins has been associated with the development of the conveyor belt for the last quarter century. In fact, if one should refer to the back files of THE INDIA RUBBER WORLD, he would find in the May issue of 1896, a three-page article on rubber conveyor belts and their use by Mr. Robins, which told about all there was to say at that time on this subject. He is the author of many useful inventions connected with belt conveying, and he is president of the Robins Conveying Belt Co. of New York.

The other rubber representative selected by Secretary Daniels, is Dr. L. H. Backeland of Yonkers, New York, who was nominated as one of the two representatives of the American Chemical Society. Though Dr. Backeland was born in Belgium, he has resided in this country for many years and has become famous by his invention of substitutes for hard rubber, notably, "Bakelite" and "Condensite." Outside of the rubber trade, he is known as the inventor of the photographic paper called "Velox." He has held many important positions in scientific societies and has read many notable papers before scientific bodies.

SENATOR COLT DELIVERS A NOTABLE ADDRESS.

SENATOR J. B. COLT, of Conn., brother of Col. S. P. Colt, president of the United States Rubber Co., delivered an address at the Rhode Island Fair held at Kingston in that State, September 1, which has attracted much attention from the press of New England. It was an admirable interpretation of the general feeling now pervading the whole country regarding the maintenance of peace coincident with a thorough preparation for war.

The senator, naturally, from his long years on the bench, takes a judicial view of all questions, and he believes that international disputes are quite as susceptible of peaceful settlement as disputes between individuals; and in substantiation of this view he cited the century of peaceful solution of all questions that have arisen between the United States and Canada. He also called attention to the advanced ground that the United States has taken in the matter of submitting international questions to arbitration, but he admitted that the time had not yet arrived when a nation's good will towards its neighbors could constitute a sufficient defence. The following paragraphs give a very fair idea of the senator's general viewpoint:

"The United States and Canada for the past hundred years have settled all controversies, some of them of a grave character, by arbitration. In this instance consent and usage have ripened into a habit, the effect being that both countries have reached such a frame of mind that it is difficult to conceive of a dispute between the two countries which they would not be willing to arbitrate. When all nations have reached this frame of mind, war will cease.

"The United States should take just pride in its efforts for more than a century in behalf of peace, justice and good will among the nations of the earth. It has led the movement for arbitration, for the rights of neutrals, for the inviolability of private property in maritime warfare, for the amelioration of the laws of war, and for the establishment of a truly international court of justice modelled on our Supreme Court.

"But today we are confronted by present conditions which we cannot escape from—the intense spirit of nationality, uncertain rules of international law and an imperfect system of arbitral justice—and while these conditions exist we are only following the dictates of reason and common sense when we insist that this country should be reasonably prepared for war."

MR. STEDMAN BACK AGAIN.

The news that Arthur W. Stedman is back in the rubber trade will be received with much satisfaction by his hosts of friends. As of yore, Mr. Stedman's particular line will be crude rubber. With offices in Boston and New York and excellent connections, his success is assured. As he states it, his business is to be "strictly commission," and the emphasis that he lays upon the "strictly" leads one to believe that he will live up to it. Mr. Stedman's Boston office is at 73 Beverly street.

NEW INCORPORATIONS.

Brooklyn Tire Co., Inc., August 30, 1915; under the laws of New York; authorized capital, \$30,000. Incorporators: William L. Cahn, Edward F. Quinn and Malvina DuFresne, all of 128 Broadway, New York City. Manufacture and deal in vehicle tires.

Davenport Safety Tire Co., The, August 7, 1915; under the laws of Arkansas; authorized capital, \$100,000. Incorporators: J. R. Alexander and W. H. McLaughlin. Location of principal office, Little Rock, Arkansas. To own and develop United States Patent No. 1,077,044.

Double Mileage Tire Co., Inc., September 22, 1915; under the laws of New York; authorized capital, \$10,000. Incorporators: John J. Mahler, 319 Electric avenue, Rochester; Warren Bulkeley, 60 Plymouth avenue; Fred McCausland, 84 Plymouth avenue, both in South Rochester, all in New York. Tires.

Economy Tire Co., Inc., September 9, 1915; under the laws of New York; authorized capital, \$1,000. Incorporators: Frank A. Koonz, 9 Robinson street; Earle C. Hall, 306 Summit ave-

nue; Edward J. Vrooman, 1206 Union street, all in Schenectady, New York. Tires and accessories.

Illinois Rubber Co., September 1, 1915; under the laws of Maine; authorized capital, \$75,000. Incorporators: Albert F. Jones, president; T. L. Croteau, treasurer, and James E. Manter, clerk, all of 281 St. John street, Portland, Maine. To produce, manufacture, buy, sell, export, import and generally deal in and with rubber and gutta percha; merchandise and substances of which rubber is a component part.

International Rubber Co., The, September 2, 1915; under the laws of Colorado; authorized capital, \$100,000. Incorporators: Charles C. Gates, John G. Gates and Ernest H. Cooper. Location of principal office, Denver, Colorado. To manufacture, buy, sell and deal in all kinds of rubber goods.

Montclair Rubber Co., August 24, 1915; under the laws of New Jersey; authorized capital, \$10,000. Incorporators: Walter F. Smith, Alice F. Smith and J. Clifford Stricker, all of Trenton, New Jersey. Location of principal office, 203 East State street, Trenton, New Jersey. To manufacture, sell and purchase all kinds of goods of which rubber is a component part.

National Pneumatic Tire Co., The, July 24, 1915; under the laws of Ohio; authorized capital, \$25,000. Incorporators: Peter Kelly, Wesley J. House and William Sylvia. Location of principal office, Cleveland, Ohio. To manufacture and sell rubber goods, tires and rubber specialties and to control patents covering same.

Nu-Septic Hard Rubber Syringe Co., Inc., September 22, 1915; under the laws of New York; authorized capital, \$1,000. Incorporators: Samuel L. Weiss, 468 Bainbridge street, Marx Finestone, 483 Park place, and Henry Klein, 723 McDonough street, all in Brooklyn, New York. Rubber goods, etc.

Rutherford Removable Rubber Tip & Novelty Co., July 27, 1915; under the laws of Washington; authorized capital, \$50,000. Incorporators: William Rutherford, W. E. Foy and H. B. Waite, all of Seattle, Washington. To buy and sell rubber supplies and automobile attachments of rubber.

Service Sole & Heel Co., August 13, 1915; under the laws of Delaware; authorized capital, \$10,000. Incorporators: John C. Gilpin, 1917 Rittenhouse street, Philadelphia; John Davidson, Rutledge, both in Pennsylvania, and Solomon F. Glenn, 322 Cooper street, Camden, New Jersey. To buy, sell or otherwise deal in rubber, leather, boots, shoes, heels and all kinds of findings.

Standard Four Tire Co., June 30, 1915; under the laws of Iowa; authorized capital, \$240,000. Incorporators: J. R. Beaver, William J. Richards, A. L. Higbee and H. S. Charles, all of Keokuk, Iowa. To manufacture, buy and sell rubber goods, such as automobile tires, accessories, etc.

Sunset Rubber & Supply Co., August 6, 1915; under the laws of California; authorized capital, \$25,000. Incorporators: E. S. Long, W. M. Friedenburg, J. H. Bathrich, Jr., Pauline F. Bathrich, L. T. Chanslor, F. P. Williams and Alice V. Deeble. Location of principal office, 1020 West Thirty-sixth street, Los Angeles, California. To manufacture and deal in rubber goods and articles of all kinds.

United Tire & Rubber Co., July 31, 1915; under the laws of Ohio; authorized capital, \$1,000. Incorporators: Jesse S. Wainright, Jacob Reinhardt and S. J. Colwell. To buy, sell, manufacture, deal and trade in auto and vehicle tires, etc.

Wood Auto Supply Co., Inc., September 9, 1915; under the laws of New York; authorized capital, \$25,000. Incorporators: Charles J. Wood, 320 Rutgers street; George E. Camp, 7 Noyes street, and Emerson M. Willis, Proctor Boulevard, all of Utica, New York. Auto and carriage tires.

Zegler Tire & Fabric Co., August 26, 1915; under the laws of Indiana; authorized capital, \$50,000. Incorporators: Casimir Zegler, Edwin R. Dean and Francis I. Hardy. Location of principal office, South Bend, Indiana. To manufacture fabric of all kinds and also automobile, bicycle and carriage tires.

JESSE E. LA DOW.

When the Executive Committee of the Rubber Club of America, Inc., at its last meeting, held September 16, elected Mr. Jesse E. La Dow of the Mansfield Tire & Rubber Co. as a member of the Legislative Committee, the club did not make the selection at random. Mr. La Dow was chosen for that position because, while a rubber manufacturer, he is also a lawyer



J. E. La Dow.

of extended practice and experience and because, furthermore, he has devoted a great deal of time to the study of the tariff and other legislative matters so far as they affect the rubber industry.

Mr. La Dow is typical of the West in this regard at least—he is full of enthusiasm and energy and believes that if a thing ought to be done it can be done. He was born in Ohio, his ancestors being among the early pioneers to that State, leaving the effete

civilization of New York State a hundred years or so ago for those remote western wilds. He attended the public schools of Ohio, and when he graduated from the Ohio Northern University in 1884 he first took a plunge into business, but after a year decided that the law was the more attractive and took up that study, with the result that three years later he was admitted to the Supreme Court of that State. He practiced law in Mansfield many years but always found the appeal of business very strong; so much so that in 1912, when the old Mansfield Rubber Co. had fallen into bankruptcy, he bought it in and held it in trust until the present Mansfield Tire & Rubber Co. could be organized by himself and associates. He was chosen counsel and secretary of the new company and his efforts, together with those of the general manager, G. W. Henne, have been largely responsible for the company's present success.

In the early part of the present year Mr. La Dow and his associates organized the Columbia Tire & Rubber Co. of Columbia, Ohio, for which he also acts as secretary and counsel.

Mr. La Dow has exceptional aptitude for organization and he is very enthusiastic in regard to the possibility of the organized cooperation of all the rubber manufacturers and their workmen in the way of legislative benefits for the industry. He believes—and his own success in that direction gives him ample ground to stand on—that employers and employees should work together for the common good and that in this connection the employer should take the trouble to inform the employee in regard to legislative enactments proposed, pointing out to the workmen whether they are beneficial or detrimental; and he believes the same course should be pursued in relation to candidates for office, state or national—that their record and their promises should be placed before the men in the factory so that they can vote intelligently as regards their own interests.

Mr. La Dow is thoroughly optimistic as to what can be accomplished through legislative activity for the good of the rubber trade if the 400 members and over of the Rubber Club, representing some 20 different states, will act together.

JOSEPH M. GILBERT WITH THE GIBNEY COMPANY.

At a special meeting of the stockholders of the Gibney Tire & Rubber Co. held in Philadelphia, September 7, Joseph M. Gilbert was elected vice-president and director of sales.

Mr. Gilbert is one of the best known men connected with the tire trade, having been prominently associated with this branch of the rubber industry most of the time since 1900. Fourteen years ago he was sales manager of the Firestone Tire & Rubber Co. Later he went to the Continental Caoutchouc Co., of which he became general manager; and when in March, 1911, the Continental company was merged with Morgan & Wright, the G. & J. Tire Co. and the Hartford Rubber Works Co. into a new corporation—the United States Tire Co.—Mr. Gilbert, was made general manager of the new company. It was said at the time that he was considerably instrumental in bringing about this consolidation of interests and later in supplanting the four individual brands made by these four companies with the United States Rubber Co.'s brand.

In April, 1913, Mr. Gilbert resigned his position with the United States Tire Co. to become president and general manager of the Lozier Motor Co., of Detroit. His acceptance of the new position with the Gilbey company indicates that Mr. Gilbert intends once more to devote his energy, experience and ability, which are of an exceptional order, to the tire industry.

MR. DUBOSC IN THE UNITED STATES.

The author of the excellent article on rubber substitutes which appeared in the September number of *The India Rubber World*, A. Dubosc, editor of "Le Caoutchouc & la Gutta Percha," is at present in the United States; indeed he is at the center of the rubber interest here—in Akron, Ohio.

RUBBER CHEMIST DISAPPEARS.

Dr. Herbert Lindener, chief chemist of the Braender Rubber & Tire Co., Wallington, New Jersey, disappeared early in September; and though a diligent search has been made for him by his friends and by the police, no trace has yet been discovered of his whereabouts. As he was in the habit of carrying a considerable sum of money on his person it is believed by the authorities that he has met with foul play.

PERSONAL MENTION.

A. D. Weber, for some years in charge of the footwear production and sales at the head office of the Dominion Rubber System in Montreal, has been appointed general manager of the Canadian Consolidated Felt Company, Limited.

On the first of September Boris Bielew of New York was appointed American representative and agent of the firm of Leonard Morris, Manchester, England. Mr. Bielew has opened an office at 59 Pearl street, New York.

F. I. Reynolds, formerly tire sales manager of The B. F. Goodrich Co., has been chosen as manager of the automobile tire department of the United States Tire Co., which is increasing its executive personnel to handle the rapid growth of business.

George H. Carnahan has been elected president of the Continental Rubber Co. of New York in place of Edward B. Aldrich, who recently resigned.

W. E. Hardy, for the past eleven years connected with the Diamond Rubber Co., and The B. F. Goodrich Co., and lately in charge of the sales of their mechanical rubber goods division, has been appointed sales manager of the Boston Belting Co., Boston.

Andrew Wightman, formerly of The Staunton Dielectric Rubber Co., Muskegon, Michigan, which is now the Vulcanized Products Co., has resigned his position as superintendent of the Vail Rubber Co., Chicago, and will make his home at San Diego, California.

H. MUEHLSTEIN & CO.

The accompanying half-tone shows the waste rubber warehouse of H. Muehlstein & Co., located at 391-5 Washington street, New York. It has a floor space of 43,000 square feet, and is in close proximity to important railroads and steamship docks.



The New York staff consists of 27 members, and the house has branches in Chicago, Akron and London. The Chicago agency takes care of all western territory, while the Akron branch covers the central states. Mr. Muehlstein, still a very young man, has developed his present elaborate organization by close attention to business and the exercise of unusual executive capacity.

PURCHASING AGENTS DINE AND TALK.

The Purchasing Agents' Association of New York held its first meeting of the season at the Hotel Breslin on the evening of September 21. After the dinner had been duly appreciated there were some interesting addresses, and, in addition, a three-reel motion picture entertainment showing the various processes used in the manufacture of steel pipe, the pictures covering the whole process from the mining of the ore to the finished product.

A number of men interested in the rubber trade are members of this association, including F. W. Lingley, of the American Hard Rubber Co., New York; A. H. Searle, of the Barrett Manufacturing Co., New York; J. A. Lampe, of the Strong Rubber & Asbestos Manufacturing Co., New York; F. M. Moore, of Alexander & Baldwin, New York; E. M. Eisenkraft, of A. Schrader's Sons, Inc., Brooklyn; J. I. McComb, of the Joseph Dixon Crucible Co., Jersey City, New Jersey; G. W. Skirm, of the United & Globe Rubber Manufacturing Cos., Trenton, and G. Winters, of the La Favorite Rubber Manufacturing Co., Paterson, New Jersey.

SEMI-ANNUAL MEETING OF COTTON MANUFACTURERS.

The National Association of Cotton Manufacturers met at the Hotel Griswold, New London, Connecticut, from September 9 to 11. The annual banquet was the special feature of the meeting. After dinner addresses were made by President Albert Green Duncan, Charles G. Bancroft and Hon. John W. Weeks. Several papers of interest to the trade were read during the meeting. A golf contest, baseball and tennis games with suitable trophies, added to the general entertainment.

TRADE NEWS NOTES.

The durability of the United States Tire Co.'s inner tubes was recently demonstrated in a novel manner by a member of the advertising force. The tube was placed around the man's waist, a rope being tied to it and drawn over a pulley. He was then lowered from the sixth floor of the First National Bank Building, New York, his entire weight being held by the rubber tubing until he reached the ground.

J. P. Devine Co., of Buffalo, New York, is actively engaged in the manufacture of machinery for numerous aniline plants, some of which are to be installed by American rubber companies, whose demand for aniline can, at present, be met in no other way.

The Boston Belting Co., Boston, has lately placed the Memphis, Tennessee, agency for its goods with the well known rubber house of Towner & Co., who will carry in stock a line of the Boston Belting Co.'s well known goods, and will be in position to supply the requirements of their trade in the Memphis territory.

The retail trade in United States tires in St. Louis will be handled by the United States Sales Co., recently organized with the following officers: Edgar Gartside Niggeman, president; George J. Breaker, treasurer, and Frederick C. D. Dobson, secretary. The salesroom will be at 3567 Lindell avenue.

The Quality Tire & Rubber Co., of Hartville, Ohio, has increased its capital stock from \$75,000 to \$500,000 and will enlarge its plant. The sales offices of the company are located in Akron.

A complete vulcanizing plant has been installed at Nashville, Tennessee, as the home of a new tire sales company. The concern will be known as the Federal Tire Service Co. Its personnel consists of Alvin Wingfield and F. W. Reynolds, both of Little Rock, Arkansas, and both experienced in the tire business. Besides the line of Federal tires the company will carry a complete stock of inner tubes, as well as all other rubber accessories manufactured by the Federal Rubber Manufacturing Co., of Milwaukee, Wisconsin.

Plans have been prepared for a new power-house, to be erected by the Falls Rubber Co., Cuyahoga Falls, Ohio. Two 150-h.p. high-pressure water-tube boilers, as well as vacuum pumps, will be installed, for power, heating and vulcanizing purposes.

Receivers have been appointed for the Morgan & Marshall Rubber & Tire Co., of East Liverpool, Ohio, on petition of Charles Stein, C. Cronin and P. McNicol, the first of whom has a suit pending against the company on a claim of \$1,600.

L. W. Hewitt, a stockholder in the Southern Tire Co., Louisville, Kentucky, has filed suit in the Circuit Court to have a receiver appointed to collect the outstanding accounts, pay off the debts of the concern, and wind up the business.

The American Fountain Pen Co. has opened a new office at 15 to 19 Maiden Lane, New York, to be occupied jointly by this company and the firm of Lewis & Hill, its export agents. F. S. Latremore, for the past two years manager of the Chicago office, will be in charge.

The Gordon Rubber Co., of Canton, Ohio, has changed its name to Gordon Tire & Rubber Co. Its capital stock of \$300,000 has been increased, and an addition to its plant is contemplated.

It is probable that Somerset County, Maine, will become a large source of supply for asbestos, valuable deposits having been found in Skowhegan by Charles H. Warren, mineralogist of the Massachusetts Institute of Technology. An extensive report has been made by Mr. Warren, in which he states that an investment of \$400,000 would be needed to make the supply available.

TRADE NEWS NOTES.

The resolution recently adopted by the American Iron, Steel & Heavy Hardware Association to the effect that the distribution of automobile accessories is to be undertaken by American heavy hardware jobbers will have important consequences, according to Secretary John C. Purdie. He believes that this action will eliminate the garage and special automobile repair man and rehabilitate the country and city blacksmith shop, and that this will mean lower repair prices.

The report of the special investigating committee appointed by Mayor Mitchell, of New York, following the subway fire of January 6, shows an extraordinary lack of proper insulation. It is alleged that rubber-covered wire which should be in conduits is left exposed and, moreover, was found to be cracked in many places. The committee recommends that electric wiring be installed in a fireproof manner throughout.

The New Jersey Automobile Trade Association is planning to hold an automobile show in Newark, New Jersey, during the last week in February.

The Ford Motor Co., Detroit, has contracted with the Marion Insulated Wire & Cable Co., Marion, Indiana, for about 300,000 feet of insulated wire—some of it as large as 300,000 circular mils—to be used in a large addition to the Ford plant.

Plans have been prepared and contracts are soon to be awarded by the Lambertville Rubber Co., Lambertville, New Jersey, for the erection of a three-story brick plant 60 x 110 feet in dimensions.

A brief has been submitted to the Interstate Commerce Commission by the National Association of Waste Material Dealers protesting against the restraint of railroads from advancing the classification on rags, waste, etc., in less than carload lots from fifth to fourth class. Specific reasons on behalf of this protest are given and members of the waste material trade hope for a favorable decision on October 13, when the case will be argued.

At the twentieth annual convention of the International Association of Municipal Electricians held in Cincinnati, Ohio, August 24 to 27, R. A. Smith, of Norfolk, Virginia, read a paper on "The Advisability of Using Concentric Wiring in this Country." An extended discussion on this subject followed.

George A. Hasson & Co., a new tire concern at Columbus, Ohio, act as agent for the Chester and Traveler lines of tires and tubes.

The Chester Rubber Tire & Tube Co., Chester, West Virginia, a subsidiary of the New York firm, is extending its plant so as to increase its capacity about eight times.

D. L. Davis Co., Fort Madison, Iowa, is planning to erect a large factory building for the manufacture of a tire inflater.

The McClurg Rubber Co. has been organized to take over the business of the S. & M. Rubber Co., of Coshocton, Ohio, its stockholders having exchanged their stock from the old company to the new, all unpaid stock in the old concern having been canceled by the courts. The reorganized company assumes all outstanding obligations. Machinery is now being installed for the manufacture of tires.

The Federal Rubber Manufacturing Co., Cudahy, Wisconsin, has erected a five-story addition to its plant, covering 50,000 square feet of space. The new building will be used chiefly for the manufacture of automobile casings.

The New York Electrical Show, ninth annual exposition, will be held at the Grand Central Palace, New York City, October 6-16.

RUBBER CLUB EXECUTIVE COMMITTEE MEETING.

The meeting of the Executive Committee of the Rubber Club was held at the Union League Club, New York, on September 16, 1915, George B. Hodgman presiding. The resignation of Francis R. Peabody of Akron, Ohio, was accepted, and Jesse E. LaDow, secretary of the Mansfield Tire & Rubber Co., Mansfield, Ohio, was elected a member of the legislative committee, *vice* Eugene H. Clapp, Boston, resigned.

The following new Firm Members were elected: Brighton Mills, Passaic, New Jersey, representative, Thomas M. Gardner and Fred Stern & Co., 44 Whitehall street, New York, Fred Stern, representative. The following Associate Members were also elected: Geo. W. Sherman, of The B. F. Goodrich Co., Akron, Ohio; J. William Fellows, of the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts; Francis S. Dane, Hood Rubber Co., Watertown, Massachusetts; Homer J. Killion, Killion Rubber Co., Dorchester, Massachusetts; Harry A. MacKusick, Philadelphia Rubber Works Co., Philadelphia; Ernest C. Clark, Clark Rubber Co., Franklin, Massachusetts.

The Executive Committee would be glad if out-of-town members as well as those resident in New York would make use of the club's commodious rooms at 17 Battery Place. Telephone service, stenographic assistance, and other general office conveniences will be furnished free to all members.

RUBBER CLUB DINNER TO BE HELD JANUARY 28.

The annual dinner of the Rubber Club of America will be held on the 28th of next January, at seven p. m., in the Astor Gallery and Myrtle Room of the Waldorf-Astoria, New York. The meeting of the Executive Committee and Board of Directors of the club, as well as of the Executive Committee of the Mechanical Rubber Goods Manufacturers' Division and the Rubber Sundries Manufacturers' Division, will be held at four p. m. on the same day, at the same hotel.

AS TO SHIPPING TIRES TO HOLLAND.

The secretary of the Rubber Club sent out, September 21, a communication to rubber manufacturers regarding a rather peculiar situation that has arisen in the export trade to Holland. The Holland-American Steamship Line, according to this communication, has informed forwarding agents that it would receive goods, including rubber—as for instance, automobiles with tires—for direct shipment to Holland in case they were assigned to the Netherlands Oversea Trust, this corporation having entered into an agreement with the British authorities.

But it appears that this agreement covers general contraband goods and does not refer to the export of rubber goods, which must be governed altogether by the agreement made between American manufacturers and the British government. The secretary closes his communication as follows:

"In view of the attitude of some forwarding agents and some steamship lines, we can only again warn manufacturers to exercise extraordinary caution over their export shipments and not let any products for export go out of their factories without positive knowledge that they will be handled in accordance with the bonds and guarantees."

ICELAND AND THE AZORES CLASSED WITH EUROPEAN NEUTRALS.

The following communication referring to Denmark, the Azores, and the Canary Islands, was sent to rubber manufacturers by the secretary of the Rubber Club, September 21:

"The British Government has ruled that Iceland, belonging to Denmark, the Azores Islands, belonging to Portugal, and the Canary Islands, belonging to Spain, are to be classed as neutral European territory when making shipments of manufactured rubber goods. Goods consigned to these islands by signers of the British rubber guarantee should be shipped by way of the United Kingdom and license obtained for re-shipment therefrom."

Very truly yours, H. S. VORHIS, Secretary.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A dealer in rubber goods in Norway is anxious to form commercial relations, on an agency basis, with American manufacturers of pneumatic tires for automobiles and bicycles and solid truck tires; also air-hose. Report No. 18,128.

A commission merchant in Brazil is desirous of communicating with American importers of rubber, etc., samples of which he will supply. Report No. 18,140.

A tire repair shop in Brazil is in the market for vulcanizing machinery, rubber paste and repair materials. Report No. 18,150.

A Brazilian firm offers American dealers an opportunity to bid on 100 tons of scrap rubber. Report No. 18,153.

The representative of an Italian firm desires names and addresses of American exporters of ceresin wax, large quantities of which are needed. Report No. 18,158.

A business man in Brazil has samples on exhibition at the Bureau of Foreign and Domestic Commerce, Washington, of carnauba wax, in the supply of which he would be glad to interest American firms. (Refer to file No. 64,706.) Report No. 18,169.

A firm in Spain wishes to secure samples of rubber for use in the manufacture of rubber stamps. Report No. 18,172.

A firm in Scotland desires to correspond with American manufacturers and exporters of textile and elastic goods similar to samples which may be examined at the Bureau in Washington or its branch offices. (Refer to file No. 64,746.) Report No. 18,205.

A brewing firm in Greece is in the market for rubber discs for beer bottle stoppers, similar to samples which may be seen at the Bureau or its branches. (File No. 64,658.) Report No. 18,213.

A firm in Italy desires to represent American manufacturers of surgical apparatus, rubber goods, hospital supplies, etc. Report No. 18,222.

A dealer in the Netherlands desires to communicate with American manufacturers and exporters of sporting goods. Report No. 18,273.

RUBBER TRADE INQUIRIES.

[117.] A dealer in specialties desires names of manufacturers of bathing shoes with rubber soles and heels.

[118.] A correspondent would like addresses of manufacturers of cement-making churns.

[119.] A rubber company wishes to get in touch with a firm manufacturing machines for braiding straight side head wires.

[120.] A South American importer of rubber heels handling 40,000 dozen or more a year, is seeking a source of supply.

[121.] Inquiry has been received for names of manufacturers of rubber in sponge form; also for the name of a manufacturer of machines for cutting the sponge rubber into shape.

[122.] An inquiry has been received for the name of a firm which can supply cotton linters to the trade.

[123.] A correspondent wishes to know where Chatterton's compound may be purchased.

[124.] We have an inquiry from South America for flat rubber rings of European standard as to thickness, quality, etc.—the rings being cut thinner than "21 to the inch."

[125.] A correspondent wishes to know where "Aristi" and "Geranium Red" can be purchased in the United States.

PROPOSED GOVERNMENT PURCHASES.

The Bureau of Supplies and Accounts, Washington, is inviting bids to be opened October 12, on Navy Department supplies as

follows: Five thousand pairs rubber boots—schedule No. 8,818; 32 swimming reels for boats—schedule No. 8,807; rubber covered wire—schedule No. 8,820.

TRADE NEWS NOTES.

One of the attractive exhibits at the 43rd Annual Convention of the International Association of Fire Engineers, held in Cincinnati, Ohio, the first of September, was the display of the Bi-Lateral Fire Hose Co., of Chicago, Illinois. The construction of their hose was explained by the representatives of the company.

Mr. Herbert Sewell, president of the Sewell Cushion Wheel Co., of Detroit, Michigan, predicts an output for this year as large as the total output of the last five years. To create additional space for stock the company is adding two stories to a one-story structure in the rear of their quarters.

The Standard Four Tire Co., of Keokuk, Iowa, expects to begin operations in its new factory building in November. The company has just purchased the entire holdings of the Amazon Rubber Co., of St. Louis, and will remove a part of the machinery to Keokuk.

The Cleveland-Ford Tire Co., Cleveland, Ohio, is erecting a factory in that city which will have a main building 46 x 300 feet, two stories and basement, with a wing 50 x 60 feet and a one-story power house 40 x 100 feet, all of brick and reinforced concrete. The following officers have been elected: President, James L. Smith; vice-president, P. C. Remick; secretary and treasurer, Walter J. Leimbach; general manager, A. E. Pearce.

The Empire Rubber & Tire Co. of Trenton, New Jersey, is erecting an office building in Boston, Massachusetts, which will be 25 x 95 feet, representing an investment of nearly \$75,000.

The Luck Tire & Manufacturing Co. is planning to erect a \$100,000 plant at San Antonio, Texas, for the manufacture of pneumatic puncture-proof automobile tires.

A newly organized firm, Loeb & Heller, will operate a wholesale metal, rubber and scrap iron business at 1250-1252 West Fifteenth street, Chicago. Both members are well known to the trade, having been in business for a number of years.

THE DE LASKI & THROPP CO. WINS SUIT.

The United States Circuit Court of Appeals for the Third Circuit has recently affirmed the decree of the United States District Court for the District of New Jersey, in the case of The De Laski & Thropp Circular Woven Tire Co. vs. William R. Thropp & Son's Co. In this litigation, which involved United States patent No. 1,011,450, owned by The De Laski & Thropp Circular Woven Tire Co., and covering its well known tire wrapping machine, the lower court held that the patent was valid and was infringed by the tire wrapping machine manufactured by the William R. Thropp & Son's Co.

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of the shares of rubber manufacturing companies on September 25 last are furnished by John Burnham & Co., 31 Nassau street, New York, and 41 South La Salle street, Chicago:

	Bid.	Asked.
Asa Gandy Rubber Co., common	300	
Alca Grieb Rubber Co., preferred	101	110
Freestone Tire & Rubber Co., common	540	
Emmerson Tire & Rubber Co., preferred	111	
The B. E. Goodrich Co., common	69	71
The B. E. Goodrich Co., preferred	108	109
Goodyear Tire & Rubber Co., common	310	
Goodyear Tire & Rubber Co., preferred	109	
Kelly-Spraghead Tire Co., common	230	235
Kelly-Spraghead Tire Co., preferred	90	92
Kelly-Spraghead Tire Co., 2d preferred	235	240
Miller Rubber Co., common	190	195
Miller Rubber Co., preferred	107	109
Portage Rubber Co., common	55	58 1/2
Portage Rubber Co., preferred	93	94
Rubber Goods Manufacturing Co., preferred	82	90
Schemmatt Tire & Rubber Co., common	86	90
United States Rubber Co., common	52	53 1/2
United States Rubber Co., preferred	106	107 1/2

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

NEW ENGLAND rubber conditions as a whole have improved materially during the past six weeks and the outlook is promising. The tire, rubber shoe manufacturers and proofers are especially busy, but makers of mechanical goods with certain exceptions are only fairly active. Some of the tire factories are working double shifts, and the product being turned out is, as nearly as can be learned, mainly for domestic consumption.

The newly formed Rain Coat Manufacturers' Association held its first official meeting in the committee rooms of the Kimball Building, 18 Tremont street, on the afternoon of Saturday, September 25, for the purpose of electing officers, drafting by-laws and converting the benevolent organization agreed upon on the Wednesday preceding into a corporation. The membership of the Association, which includes all but one large and two small companies of this class of raincoat manufacturers, is confined within a radius of 25 miles of Boston. The recent strike has been virtually settled, as over 95 per cent. of the workers have returned to work. The officers of the association are William Lichtenstein, president; Samuel Goldstein, vice-president; H. P. Gordon, treasurer, and Daniel Harris, secretary and general counsel.

The directors are William Lichtenstein, Samuel Goldstein, H. P. Gordon, Barney Bennett, Lewis Fein, Louis Simmons and D. S. Shapiro. The attorneys for the association are Harris & Harris, 18 Tremont street, Boston. Included in membership are the following twenty raincoat companies: Bay State Raincoat Co., Bennett Bros. Raincoat Co., C. & C. Raincoat Co., Crowne Raincoat Co., Eagle Raincoat Co., Goodrich Raincoat Co., Hub Raincoat Co., International Raincoat Co., Metropolitan Raincoat Co., Monarch Raincoat Co., New England Raincoat Co., Panama Raincoat Co., Red Cross Raincoat Co., Star Raincoat Co., Tremont Raincoat Co., United Raincoat Co., Universal Raincoat Co., Washington Raincoat Co., Rubin Mfg. Co., Weatherproof Garment Co.

Building materials worth \$15,000 and four freight cars were destroyed by fire and a gasoline explosion in the yard of the Fisk Rubber Co., Chicopee Falls, on July 15. The company's buildings were in great danger and the chief of the fire department has received a letter of commendation with a check for \$25 enclosed for the Firemen's Benefit Association, in appreciation of the work of the department in checking further damage.

A rumor has been afloat that the explosion was due to a German plot, possibly the act of a "crank"; but there seems to be no foundation for this, save the present excitable state of the public mind.

"Fisk Day" was celebrated on September 4 by a holiday with pay for all the employees of the company, the total cost in free wages amounting to close upon \$10,000.

The Alden Rubber Co., 58 Thayer street, succeeds the Hoyt Rubber Co. of the same address. The present officers of the company are G. Edwin Alden, president; B. E. Phillips, treasurer, and John Alden, secretary. They are making a general line of molded specialties.

The Boston employees of The B. F. Goodrich Co. recently held their annual outing at Lexington Park, Lexington, 250 being present. After a ball game there were field sports, all well contested, including some novelties, among them the "Inner Tube" race, the "White Boot" endurance run, and the "Hipress" race. The Goodrich delegation of footwear salesmen, headed by Director of New England Sales on Footwear, J. S. Capen, took prominent parts in these events. It is a question who enjoyed the feature races the more, the participants, or the audience. Luncheon

was served in the grove. In the evening, a theatre party was enjoyed, after which special cars were waiting at the Park entrance for the return trip.

The King Rubber Co., Hyde Park district, have just completed a brick factory, 125 x 65 feet, and are about ready to move in. They will shortly put out a most attractive line of tobacco pouches, said to possess a number of new features.

C. P. Lovering Co., East Cambridge, are making a composition sole and heel with a rubber binder, which they claim is as durable as leather and will hold stitches as firmly. This is a resilient product which does not draw and it can be successfully attached to McKay and Turn Shoes, in the soling and healing of which only the best leather has been previously used. This company also makes a line of rubber soles and heels as well as molded insulation.

This is the day of clubs and associations; and they are good things. One of the most interesting is the Friction Plug-Heel Manufacturers' Association, with headquarters in Boston. The representatives meet semi-occasionally, swap trade gossip, have a dinner and, incidentally, get exceedingly well acquainted with each other.

The first unit of the factory building of the Atlantic Rubber Co., of Atlantic, designed by J. A. DeWolff, has recently been completed and is a model of factory construction and arrangement.

The B. & R. Rubber Co., of North Brookfield, has purchased control of the Wills carton erecting and filling machine for jar rings.

The Duxfut, "the sole that floats," and the Para Oak soles, according to shoe manufacturers, are the equal if not the superior of leather soles. The A. & A. Rubber Co., of South Framingham, is to be congratulated for their production.

The Plymouth Rubber Co., Canton, Massachusetts, is making a very energetic and successful push on its "Durable-Kompo" soles, which is particularly timely, as the price of sole leather soars higher and higher.

The Annual Fall Convention of the salesmen of the B. & R. Rubber Co., was held at the factory, North Brookfield, during the second week of September.

Captain Francis H. Appleton recently returned from a very pleasant trip to the Panama Exposition at San Francisco, which he attended as one of four delegates from Aleppo Temple to the Imperial Council of The Mystic Shrine, which convened at Seattle. The delegation, which included J. W. Work, the well-known maker of lasts for rubber footwear, traveled in a private car and were accorded most cordial receptions at Seattle, and other western cities. Captain Appleton, who was accompanied by Mrs. Appleton, stopped over at Buffalo and Lake George, where they spent a delightful month on the return trip.

The captain gave a dinner to Colonel Sidney Hedges on the occasion of that gentleman's 71st birthday on Monday, September 27, at the Algonquin Club, Boston. Colonel Hedges was for more than 25 years the New England manager of the Mutual Benefit Life Association of Newark, New Jersey, retiring last year. He is prominent in masonic and military circles, and was formerly in command of the Ancient and Honorable Artillery Co. of Boston.

Charles A. Coe, Eastern selling agent of the United States Rubber Co., 140 Essex street, recently started West on his annual trip. He will cover Middle Western states and will be away four or five weeks.

Harold P. Fuller, of E. H. Clapp Rubber Co., returned last Saturday from a week's tour of Canada. He states that business conditions there are very favorable.

The Banigan line in New England is now represented by A. E. Barney, formerly with the LaCrosse Rubber Mills Co., of LaCrosse, Wisconsin.

Walter F. Thomas, of the Tycer Rubber Co., of Andover, Massachusetts, was married at the Hotel Somerset, Boston, September 18, to Miss Helen K. Goss, of Melrose.

Arthur W. Stedman, before his plunge into the crude rubber business at his new office, 69 Beverly street, made the week of September 20-25 a "golf week." It is said that he lowered his previous scores by many points and re-enters the rubber trade with a firm belief that were rubber not his manifest destiny he could easily become the champion golfer.

The New England men, even when they are transplanted to New York, get back home for vacations. For example, Charles W. Barnes, the assistant manager of sales of the United States Rubber Co., spent his vacation at Duxbury, Massachusetts.

George H. Mayo, manager of branch stores of the United States Rubber Co., put in the heated term at Wolfboro, New Hampshire.

H. C. Kalish has returned from a trip to the Panama-Pacific Exposition. Mr. Kalish, it will be recalled, is manager of the Wales-Goodyear department of the United States Rubber Co., of New England.

Mark M. Converse, of the Converse Rubber Shoe Co., of Malden, owns a farm in Lyme, New Hampshire, where he spent his summer vacation.

The many friends of William S. Mayo, that veteran of the rubber shoe trade in Boston, will be glad to know that the operation he recently underwent at Corey Hill Hospital, in Brookline, was successful and that he is rapidly convalescing.

North Brookfield, in this State, is possessed of an inventor of rubber devices of a great deal of value. This inventor is Arthur J. Wills. Some of his machines are: Overflow trimmer for mold work, such as heels and mats; automatic blister pricking apparatus for rubber mats; a cutter for baby carriage tires; jar ring cutting lathe; duck plug cutter for rubber heels, etc.

George E. B. Putnam, Boston correspondent for THE INDIA RUBBER WORLD, is spending his vacation at Camp Kingfisher, Norway, Maine.

In the exceedingly comfortable parlor of the Point Shirley Club, Point Shirley, Massachusetts, are two fine oil paintings. One is of Capt. Francis H. Appleton, the present president of the club, and the other is of Joseph Work, the ex-president. Both are very well known in the rubber trade.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent

NOW that the summer vacation season has passed, the rubber factories of the State are resuming their stride, and overtime is again becoming the rule in several of the plants. Whether or not business is rushing depends largely on whether the particular plant under consideration deals in those supplies which are most necessary to the European nations now at war or to the automobile trade, in which there never seems to be any cessation of activity.

The increased call for rubber footwear, and for tennis shoes in particular, which has been prevalent throughout the United States during the last few months, has made itself felt at the Narragansett Rubber Co.'s plant in Bristol. This corporation has been and is now busy shipping large quantities of tennis shoes, arctics and other rubber footwear, the demand being not only large but well distributed.

The Bourn Rubber Co., Providence, reports a keen demand for rubber shoes of all kinds. While there are large orders for arctics, rubber boots, lumbermen's and Alaskans, tennis shoes have enjoyed a marked popularity, the sale for this class of goods exceeding all previous years.

The annual returns of the Board of Tax Assessors of the city of Providence were filed with the City Treasurer on September 1 and show a total levy of \$5,063,520.76. In the list of corporations, concerns and individuals assessed for \$50,000 or more, together with the valuation placed upon their property by the Board are the following: Joseph Banigan estate *et al.*, \$450,640; Joseph Banigan estate, \$1,000,480; Joseph Banigan Rubber Co., \$160,100; Augustus O. Bourn, \$113,640; Bourn Rubber Co., \$147,000; Walter S. Ballou, \$248,880; Samuel P. Colt, \$210,100; Davol Rubber Co., \$400,000; Mary E. Davol, \$748,600; Glendale Elastic Fabric Co. of Massachusetts, \$175,300; Mrs. Lotta P. Kelley, widow of Arthur L. Kelley, \$91,640; Mechanical Fabric Co., \$342,740; New England Butt Co., \$193,420; Samuel M. Nicholson, \$249,600; Trustee under will of Joseph Davol, \$450,000; Revere Rubber Co., \$1,447,280.

The International Rubber Co., of West Barrington, is to have a spur track from the line of the Fall River and Bristol division of the New York, New Haven & Hartford Railroad, put in to facilitate the handling of raw material and the manufactured product-carriage cloth. The New Haven railroad officials have consented to the plan and permission has also been granted by the Town Council, and the rails will be continued into the company's yards.

The work of erecting a new vulcanizing room at the plant of the International Rubber Co. is completed and the new structure is now being equipped for use. The company has been granted permission for the erection of a one-story brick dry house, 25 x 76 feet, to be steam heated.

The Revere Rubber Co. has plans for the construction of a new laboratory, of one story, reinforced concrete, as an addition to its plant on Eagle and Valley streets, Providence. Dr. W. P. Bradley, one of the chemical experts of the corporation, has compiled data for a new method of manufacture, and the new building, when completed, will be used for the mixing of chemicals for the new process. It is said that the new laboratory will be one of the finest of its kind in this country.

The old sugar refinery building on Thames street, Bristol, has been taken over by the National India Rubber Co., and is being completely remodelled from foundation to roof. When completed it will contain four stories and basement, and will be made to look like an entirely new structure. A shell of brick is being constructed on the outside and new and more shapely windows are being placed. Vice-president LeBaron C. Colt says that the building is to be used by the National company as a storehouse and that separate departments will be arranged on each floor for the various kinds of finished goods manufactured by the concern.

Several improvements have been made recently upon the buildings of the Narragansett Rubber Co., Bristol.

The Rutherford Rubber Co., a corporation of East Rutherford, New Jersey, has filed notice with the State Secretary of Rhode Island that William O. Cook, of Providence, is the accredited legal representative in this State.

The Phillips Insulated Wire Works has commenced the erection of a new three-story brick building on Central avenue and Freeman street, Pawtucket. It will be of mill construction, 100 x 70 feet.

Colonel Samuel P. Colt, president of the United States Rubber Co., on September 10 made a general inspection of the plant of the National India Rubber Co., at Bristol, of which he is also president, visiting every department.

W. Mulry has opened at 97 Empire street, Providence, an em-

porium for automobile accessories. He will make a feature of factory seconds of all makes of tires.

* * *

George H. Campbell, for 21 years employed as foreman at the plant of the Collyer Insulated Wire Co., Pawtucket, died at his home in Mansfield, Massachusetts, September 1.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

TRENTON is pushing steadily ahead as one of America's most important rubber centers and in line with this program comes the announcement that many thousands of dollars are to be expended at once in adding to the capacity of the factories here.

The Ajax-Grieb Rubber Co. has announced that it will erect an extensive addition to its plant, enabling it to give employment to five hundred additional hands—practically doubling the firm's output. The new addition will be made on land already owned by the company. The main new building will have a frontage of 350 feet and a depth of 60 feet. It will be three stories high. Another mill room 150 by 150 feet will also be constructed.

In announcing the company's intentions in this direction it is also stated that a dividend of 7 per cent. on preferred and 24 per cent. on common stock has been declared.

The Thermoid Rubber Co. is building a \$25,000 addition to its plant. Part of the new structure will be devoted to the making of hose, and the rest of it will relieve other departments of the factory already overcrowded. A contract for additional machinery has already been placed. The new building, which is to be of brick and steel, will be 190 feet long and 71 feet wide, and two stories high. With the completion of the new structure the company will be enabled to place about 75 more operatives at work.

The FitzGibbon Company, large users of rubberized cloth in the making of automobile tops, have placed a contract for the erection of a new factory 90 feet wide and 700 feet long, which will enable the firm to increase its capacity many times.

The Mecca Tire Co. has begun to make tires in its newly acquired factory on Mulberry street. It will market the line under the name of "Peerless." The tires are to be white with a tread bearing a triangular design. The plant, which is being fitted up by the William R. Thropp & Sons' Co., is not in full operation as yet; but one vulcanizer is now employed and another is to be installed soon.

Announcement is made that the Z. Z. Tire Co., which is rushing work on its Yardville plant, will be ready for operation about January 1.

The unusually wet weather since the first part of June has caused a big falling off in orders for garden hose. Salesmen report that dealers have thousands of feet of garden hose piled up in their warehouses. As this is the normal time to take orders for next year's delivery the real effect of the present situation will be felt next year. The raincoat and footwear people have, on the other hand, experienced an increased demand for goods.

Thomas McGuire, who has been an inside man for the United and Globe Rubber Manufacturing Cos., has taken a road position, covering Southern territory, for the same firm.

The old factory of the Brookville Rubber Co. has been opened as a reclaiming plant by a company of which E. R. Sollday

of this city is the head. Mr. Sollday, who is also connected with rubber interests at Lambertville, is very ill at present with kidney trouble.

John A. Lambert, of the Acme Rubber Manufacturing Co., has been nominated for trustee of the Trenton Chamber of Commerce, the election being held October 12. The Chamber of Commerce is endeavoring to have the Pennsylvania and the Philadelphia & Reading railroad companies erect additional freight stations at points more advantageous for some of the rubber mills.

Among the concerns filing articles of incorporation in the office of the Secretary of State this month is the Montclair Rubber Co., with offices in the Wilkinson Building, Trenton. The capital stock is given at \$10,000. The incorporators are Walter F. Smith, Alice F. Smith and J. Clifford Stricker.

In connection with an accident which resulted in the death of a man at the plant of the Essex Rubber Co., Judge Marshall of the Mercer Court of Common Pleas has interpreted the Workmen's Compensation Act in a way which is of particular interest to manufacturers. The workman was employed by a rigger who was erecting some scaffolding at the plant. The rigger loaned the workman to a structural iron contractor who was erecting an addition to the factory. It was while he was actually employed by the structural iron man that he was killed in a fall. The court held the original employer liable, and a verdict for \$3,000 damages was awarded.

It is stated that the Colorado Tire & Leather Co. of Denver, Colorado, which has hitherto had its milling and calendering done by an Ohio factory, intends after the first of November to do this work in its own plant. With this in view the company, according to reports, has been interviewing several department heads in Trenton mills in regard to taking positions in the Denver factory.

Joseph Thropp, secretary of the William R. Thropp & Sons' Co., makers of rubber machinery, is recovering from an operation for appendicitis.

The John A. Roebbling's Sons Co. is erecting a new auditorium at the corner of Sixth avenue and Main street, to accommodate desired entertainments. It will have a dance hall, a stage, a convention platform, and a basketball floor.

The Roebbling Construction Co., a subsidiary of the John A. Roebbling's Sons Co. has filed a certificate of dissolution with the Secretary of State.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

AKRON is no "fair weather friend" of industry, according to the report of the chief statistician of the state industrial commission, recently made public. In spite of the thousands of unemployed last year, few business concerns and industries shut down absolutely; and two of Akron's rubber plants gave their employees full time during the year; one ran overtime and comparatively few operated less than 300 days. Thirteen rubber factories worked their employees between 54 and 60 hours a week.

Reports of an exceptionally prosperous year for The B. F. Goodrich Co. are back of the marked advance in Goodrich common stock, which touched its highest point since 1912 on the New York Stock Exchange and in the Akron market during the month of September. Nearly 15,000 shares changed hands on the New York Stock Exchange in one day, and there was a large volume of private trading in Akron.

President H. S. Firestone, in his annual report at the meeting of the Firestone Tire & Rubber Co., held at the general offices at Akron, September 1, stated that sales during the fiscal year amounted to \$25,187,884.33, an increase of \$5,937,744.41, or 31 per cent. over the preceding year. He explained that the company is now producing 7,500 pneumatic tires daily and that after the factory additions now under way are completed it will turn out 12,000 tires per day, or an increase of 60 per cent. All the old directors were re-elected.

The Firestone company has contracted for an eight-story building at Kansas City, Missouri, to be completed next spring. It will be built of steel and concrete with a terra cotta exterior, and will cost between \$150,000 and \$200,000. The first floors are to be occupied by the tire company and the top floors leased for loft uses.

* * *

The Firestone Company held its third annual "Homestead Outing" on September 18. Fifty autos decorated with flags, banners and pennants carried foremen, superintendents and officials numbering 200, sixty miles to the old Firestone homestead at



"HOMESTEAD OUTING" OF FIRESTONE TIRE & RUBBER CO.

Columbiana, where they spent the day as guests of President H. S. Firestone. Following a bountiful feast in an immense tent, all renewed their youth with happy zest in ball games, "quoits," etc.; camera and "movie" men snapping the various activities for a permanent record of the day of jollification.

* * *

Five new buildings in Akron are nearing completion for the plant of the Goodyear Tire & Rubber Co. This will mean an addition of about 2,000 more employees.

It is reported that the Goodyear company has sold to the Spanish government two war balloons, which are now being built at the aerial department of the Goodyear plant.

The office help of the Goodyear company are now carried to and from work in a double-decked 34-passenger jitney owned by the company. In appearance the new transportation wagon resembles a truck with a second floor attached.

* * *

The Marion Tire & Rubber Co., which was recently incorporated in Marion, Ohio, has taken over the plant formerly occupied by a shoe company and will install tire-making machinery. It is announced that an Akron rubber man will manage the plant, but his name has not been divulged. It is planned to start active business in about six months. The capitalization of the company is \$300,000, of which one-half is preferred stock, the

other half being common. J. L. Price, S. B. Lippincott, W. H. Holverstott, R. T. Lewis, A. J. Berry, W. T. Jones and W. F. Moyer are the principal stockholders in the new corporation.

* * *

The Mohawk Rubber Co. is planning to erect a two-story addition to the new four-story building now nearing completion. The dimensions of this addition will be 43 x 61 feet and it will cost about \$5,000.

The name of the Gordon Rubber Co. of Canton, Ohio, has been changed to the Gordon Tire & Rubber Co. The firm will specialize in the manufacture of automobile tires.

Papers have been filed changing the name of the O'Neil Tire & Protector Co. to the O'Neil Tire & Rubber Co.

It is reported that the American Tire & Rubber Co. has received a large order for tires for the Allies. The company has advertised for an additional force of tire makers.

The Miller Rubber Co. has started a free tire service in Akron which has attracted widespread attention. Five service cars have been allotted to this work, and no matter what make of tire is used a telephone call will bring a service car to fix the trouble free of charge.

Stockholders of the Excel Rubber Co., makers of rubber accessories, have asked for a receiver. The company's liabilities are said to be \$16,000, with assets of \$6,000.

* * *

Harry C. Miller has been appointed general sales manager of the pneumatic tire department of the B. F. Goodrich Co., succeeding F. I. Reynolds, who resigned last June. He will have the management of both the Goodrich and Diamond pneumatic tire sales and will make his headquarters at the factory in Akron.

Mr. Miller has had a comprehensive experience in other branches of the company, having handled equipment contracts with the big Michigan manufacturers when he was manager of the Detroit branch, and having had charge for several years past of all sales on the Pacific Coast and in the Hawaiian Islands and the Orient.

C. B. Raymond, secretary of the Goodrich company, was among the principal speakers at the opening of the new Akron water works on September 1.

Robert K. Sheppard, formerly manager of sales for the insulated-wire department of the Goodrich company, is now sales manager for the Simplex Wire & Cable Co., Boston.

George Talbot, one of the oldest men in point of service in the sales department of the Firestone Tire & Rubber Co., has been elected mayor of Urbana, one of the leading cities in Illinois, where he will assume his duties on the first of the year.

THE RUBBER TRADE ON THE PACIFIC COAST.

The Los Angeles branch of the Federal Rubber Co. has moved from South Olive street to larger and more commodious quarters in the Morrison Hotel Building, at Pico and Hope streets.

* * *

The Hunter-Smith Sales Co. have adopted the plan of sending out a Sunday service car on the various highways at Tacoma, fully equipped with a wrecking crew, a full line of tires, and all necessary implements to extricate stranded motor cars from ditches and hazardous places. This should be a great boon to tourists.

* * *

Charles H. Minto, well and favorably known in the automobile, motor and bicycle tire trade, and for the past fifteen years connected with the Hartford Rubber Works and their successors, the United States Rubber Co. of California, has recently been appointed manager of the tire department of the San Francisco store.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

FOREIGN TIRE IMPORTS.

A MATTER which is attracting considerable notice in our press, from such staid publications as the "Quarterly Review" down to the half-penny daily, is the increased importation of American motor cars and also tires. It is with the latter that we are mainly concerned in this journal, though, of course, the car business is the more important. There is no need to emphasize the fact that German and Austrian tires are unprocurable and that French and Russian are much restricted in their supply. It should, however, be said that before the war tires were imported because of various business interests and not because they could not be obtained of home manufacture. At the present time, as our rubber tire works are all busy on government requirements, no doubt private customers experience delay in the filling of their orders and this has certainly been to the advantage of sellers of American tires, who have been energetic in pushing their wares and have established a series of important distributing depots up and down Great Britain to supplement the selling organization which sufficed for the pre-war business.

I am not going into the matter of the American exchange here, but as we are continually being exhorted to buy as little from foreign countries as possible, it is obvious that this applies to the purchase of home-made tires. Patriotism, however, frequently fails to rise to the heights demanded of it, and in this respect the tire manufacturers find it necessary to advocate an impost on foreign tires, and to judge by the tone of the utterances of erstwhile large tire dealers, it would not be surprising if something were done in this direction, though the main move will be directed at the more important car, of which the tire is only an accessory. It is understood that this matter will come up for early consideration on the re-assembling of Parliament. With regard to the contract for American tires placed by makers of American cars in England, I am authoritatively informed that the intention was to place the order in Great Britain, but that prompt delivery could not be guaranteed.

Leaving this topic, I may say that one or two recent occurrences in which journalists have come within the mesh of our war laws indicate that contributors to foreign papers must walk or, rather, write warily. I must bear this in mind while also remembering that every column I write helps to reduce the adverse balance of untold millions which is troubling our financial experts at this time. Some day, perhaps, the world will have the history of our anti-submarine warfare and this is not the time or place for premature disclosures. I think, however, it is a safe assumption that the recent fall in the price of rubber is largely due to the official statement from the Admiralty that the submarine menace is well in hand, the natural deduction being drawn that the arrival of supplies from the East is pretty well assured.

As far as government orders are concerned, both for our own services and for those of our allies, there is at the time an absence of the rush and excitement of twelve months ago, which means that the manufacturers have the situation well in hand. Indeed, in some quarters it is asserted that the easing off of this business is due to the placing of orders in America, though I have no satisfactory evidence of this and am much inclined to doubt it. In concluding this paragraph I should like to mention the appreciation with which the editorial in the August issue of *THE INDIA RUBBER WORLD*, headed "Shall We Keep the Faith?" has been received by

British subscribers. As the judgment in the "rubber or gum" Prize Court case has not yet been delivered I must defer any comments until next month.

ERASING RUBBERS.

In my last notes I made reference to a substitute for erasing-rubber and in case an impression should be created that the genuine article is being superseded, perhaps I may be allowed to say that rubber erasers are being made by our rubber works to a much greater extent than before the war, owing to the cessation of German and Austrian imports. For instance, the North British Rubber Co., Limited, have been paying particular attention to school and stationers' rubbers, with the view of putting on the market a line of goods to replace the many varieties which in recent years have come in large quantities from the continent. The North British list comprises fourteen brands or qualities, each with a distinctive name, the number to the pound in weight being an index to the size; the prices varying from 1s. 8d. per pound in boxes to 3s. 1d., this latter price referring to a special quality for erasing pencil marks from tracing paper in drawing offices.

THE WICKHAM HARD CURE PROCESS.

The report of the Dunlop Rubber Co., Limited, with regard to plantation rubber cured by this process (see *THE INDIA RUBBER WORLD*, March, 1915), which is the property of a British limited company, will necessarily prove disappointing to those financially interested. Presumably this report is to be taken as a House of Lords' decision, from which there is no appeal, though of course we all know the prevailing tendency of rubber manufacturers and experts to arrive at contrary conclusions. The virtues of creosote *per se* and the retaining of moisture in the rubber have proved to be based on unreliable ground. The result in effect is to support the opinion long held by a good many of us that the high tensile strength of the Brazilian product is primarily due to the age of the trees rather than to any magical result of the smoking process, efficacious though this may be in some respects. As the age of the trees is one of the things that the great scientific resources of the Eastern planters cannot in the nature of things alter, the Brazilian need not fear that his supremacy will be taken from him.

TRADE PROFITS.

Many of our prominent rubber works being private enterprises or private limited companies which do not publish their balance sheets, the public has no means of arriving at their profits or losses. As all the rubber companies of any standing have, however, on their own showing been extremely busy during the war, it is only natural to assume that the private concerns have done equally as well as those whose balance sheets are published in the papers. In the case of the Leyland & Birmingham Rubber Co., Limited, we note an increase of 50 per cent. for 1914-15 over 1913-14 and over 100 per cent. as compared with 1912-13. The customary dividend of 7½ per cent. is increased for this year to 12½ per cent. This absorbs £33,532, and it is notable that unusually large allowances have been made for depreciation, reserve for discounts, bad and doubtful debts, and that £10,000 is carried to reserve, which now stands at £45,000, as against an issued ordinary share capital of £268,257. With regard to the profits made lately by rubber companies it must be borne in mind that the price of raw rubber has not only been at a moderate figure, but there has been an absence of violent fluctuations—conditions which are favorable to the manufacturer.

ASSOCIATION FOR ADVANCEMENT OF SCIENCE.

The British Association for the Advancement of Science held its 85th anniversary meeting this year at Manchester. Hitherto at these meetings the subject of synthetic rubber has been quite prominent. This year it practically did not enter into any of the discussions. One of the most interesting features of the meeting was the inspection by the members of the Association of the cable works at Trafford Park of W. T. Glover & Co., Ltd. At a luncheon given by the company to the visitors the managing director, E. A. Claremont, who acted as chairman, gave an interesting account of the origin of the company 50 years ago, the founder being a Salford draper who conceived the idea of covering crinoline steel with waxed cotton so that damp would prevent the steel from damaging the dress fabric. From this small beginning the insulation of cables arose, necessitating the removal to a Salford works, which were repeatedly enlarged until about 15 years ago the present works were built on a more modest scale than they exist today. With regard to the war, Mr. Claremont said they had had to make very large quantities of telephone wire for field service; this material only had temporary use, as it could not be picked up again in active warfare for future use.

The visitors were then conducted through the works, where they inspected the various processes of pickling, drawing and tinning the copper wire; the insulation of the wire either with paper, rubber or bitumen; the lead covering where the molten lead is applied at a pressure of 13 tons to the square inch; the armoring and final testing. The paper cables, which are specially for use in damp situations, are insulated with Glover's diatrine, which is paper treated with a special insulating compound. After seeing the making of paper insulated telephone wires a visit was made to the rubber department. Although at an earlier period of the firm's history the rubber compounds were bought manufactured up to the vulcanizing stage, this is not now the case, a complete rubber manufacturing plant being now installed. This proved of special interest to the visitors. The only rubber on view was a quantity of Fine Hard biscuits and it was stated that only small quantities of plantation rubber were used and no inferior brands or reclaimed rubber. Among the foreign orders the firm has in hand is a cable for the Calcutta Electric Supply Co. to carry a pressure of 30,000 volts, and this is being tested up to 75,000 volts. The tendency of recent practice in electricity is the employment of higher and higher pressures and a new responsibility is thrown upon insulated cable makers.

Among other works which received parties of members of the association were the British Westinghouse Co. and the Ford Motor Co. (England), Limited.

IS BRITISH RUBBER LEAKING INTO GERMANY?

For some time it has been believed in Mincing Lane, that Germany was still succeeding in obtaining supplies of rubber from Great Britain, and it has been suggested that the rubber trade should cooperate in refusing to sell to firms of alien origin. It is stated that 60 per cent. of the crude rubber sold in London is sold to German firms whose members have become naturalized British. Some people profess to believe that export figures show that there exists a serious "leakage." The Board of Trade returns for the first six months of 1915 show that British exports of rubber to "other countries" (the United States, France and Russia) were very nearly double what they were in the corresponding period of 1914, amounting in value to £1,088,000 (\$5,294,752), as compared with £549,000 (\$2,671,709) exported during the first six months of last year. Shipments to Germany and Belgium during the first six months of 1914 amounted to £1,650,000 (\$8,029,725), so that even were the

whole of the excess of exports to find its way to Germany, that country would still be receiving but one-third of its quantity of crude rubber. It must also be taken into consideration that neutral countries are obliged to supply themselves with many rubber articles they formerly imported from the countries now engaged in the war, and this has stimulated their domestic rubber industries and rendered increased imports of crude rubber necessary. No doubt some leakage has occurred but it is probable that it has been of little importance. At a meeting of the Council of the Rubber Growers' Association, a special committee was appointed to consider this question.

SYNTHETIC PRODUCTS CO.

The English company formed to manufacture synthetic rubber has published some interesting information in its general annual report.

A factory known as the Rainham Works, was installed for experimenting with the manufacture and the vulcanization of synthetic rubber, but work has been stopped as the government commandeered the factory.

Of the total paid-in capital of the company there only remains £1,289 (\$6,273) in the banks, a great part of the capital having been spent in installing the experimental plant. The cost of scientific research amounted to over £12,000 (\$58,398), and the company has spent £40,000 (\$194,660) without having sold any rubber. In spite of the declarations of the managers it appears that the undertaking was not on the way to success.

The manufacture of acetone at Kings Lynn seems to be giving good industrial results in spite of the difficulties experienced in separating properly the two bacterias that act on the starch. All the acetone manufactured since June, 1914, has been purchased by the British war department.

THE RUSSIAN-FRENCH INDIA-RUBBER, GUTTA-PERCHA & TELEGRAPH WORKS, "PROWODNIK."

The Russian-French India-Rubber, Gutta-Percha and Telegraph Works, "Prowodnik," of Riga, Russia, reports gross profits of £6:0000 (\$3,211,890) in 1914, against £415,000 (\$2,019,598) in the previous year. As the company maintains branches in Germany and Austria, it was necessary to deduct a large sum for "doubtful" debts in addition to £165,000 (\$802,973) for ordinary depreciation, as against £100,000 (\$486,650) in 1913; so that there only remained £180,000 (\$875,970) available for distribution, as compared with £252,000 (\$1,226,358) distributed to shareholders in 1913. The dividend proposed was £1 (\$4,8665) per share on the capital of £1,800,000 (\$8,759,700), as compared with £1. 4s. (\$5.87) per share paid in previous year. The actual payment was postponed until September on account of the depreciation in the Russian rate of exchange.

TIRE FAMINE IN SWITZERLAND.

It is reported that the Swiss government has caused census bureaux to be opened throughout the country for determining the quantities of cycle, motor cycle and automobile tires available for immediate use. Owners and holders of such tires are under obligation to report at these bureaux.

The latest monthly report of the electricity bureau in the communications department at Tokyo gives an increase of 14 in the number, and \$541,475 in the combined capital of electric enterprises since the end of the year 1914; of which power suppliers make up the largest number. During May four companies were promoted in Hokkaido, Niigata, Nagano and Ishikawa Prefectures for the purpose of carrying on lighting operations, with a combined capital of \$62,897 and total power generated of 267 kilowatts.

The Rubber Trade in Germany.

By Our Regular Correspondent.

THIS country has been at war one year, and I therefore believe it appropriate to begin this letter with a brief review of the past twelve months.

Immediately after the outbreak of the war the Imperial government took the necessary measures to minimize the ill effects of war conditions and the German people, with extraordinary flexibility, adapted themselves to the situation. For the past twelve months we have been patiently and hopefully supporting the burdens of the war. Commerce and industry have suffered all sorts of losses through the increased cost of raw materials, the suspension of practically all foreign trade, and the falling off of home trade.

The war began under conditions favorable to our armies and all counted on an early peace. This being the feeling, speculation continued active until the government saw itself obliged to regulate the prices of all necessities of life. England then declared her "starving-out of Germany" policy. Speculation was dead, but the prices of commodities had already reached such a level as to cause great distress among our poorer people. Workmen saw the cost of living constantly increasing, while wages followed the opposite course. Large concerns, as well as the government, were obliged to take measures to keep their employees from starvation. In all the lines where war contracts were not available there was a great number of unemployed. The Allies' blockade was not alone responsible for our sufferings, for it must be borne in mind that before the war our enemies were our best customers.

Considerable export trade was done through Italy until that country declared itself for our enemies, when this all came to a full stop. England perfected her control of the shipping of the Netherlands and of the Scandinavian countries, and what little foreign trade remained was curtailed by the different embargoes our government was obliged to declare. Our commerce and industries have suffered incalculably, but, in spite of all that, I can truthfully say that both our commerce and our industry are in a healthy condition. We have learned how to cooperate efficiently and help each other. If we do not forget the teachings of this year the good to us will be well worth the sacrifices.

The rubber industry was among the first to feel the stress of war. Outside of those which could accept government contracts for tires, surgical goods and the like, few factories were kept going. And even those which were working night and day on war orders did so at little profit.

At the beginning of the war, when the prospect looked bright for the German armies, rubber men, like all the rest of Germany, felt sure that peace would be a matter of weeks and the raw material problem received little or no attention, the only cloud being the lack of skilled labor and the government's seizure of all supplies of benzene and benzol. But as the war continued and prospects of early peace faded away, the shortage of raw materials was keenly felt, prices became prohibitive, and skilled labor became more and more scarce. The shrinkage of credit obliged manufacturers to pay cash for all raw materials, and in turn they had to demand cash from their customers. This has caused much ill feeling in our rubber trade.

Some foreign trade was done until the prejudices of the Roumanians and the Italians, who feel their racial attachment to France, made matters too difficult for German salesmen. The strict enforcement of the British rubber embargoes put the final touch to the destruction of the splendid optimism that witnessed the beginning of the war. The calendar year ended with little or no profits to show, but still with good hopes for the future. Conditions, however, have not improved; on the contrary, it can

be safely said that as long as the war lasts our rubber industry will continue to suffer.

In spite of the restrictions placed on the use of motor vehicles some dealers are still able to offer cars for sale; in certain instances equipped with new tires. Rumor has it that these fully equipped machines have found their way here from America. Automobile interests here are already taking steps to have the government exercise care in disposing of its used automobiles and motor trucks after the war is over. Ways and means are being devised to distribute these machines without causing too great disturbance in motor values. Rubber factories are interested in this movement, which directly concerns them. At the present time our automobile factories are working night and day on government orders.

Artificial rubber rumors are continuing to go the round of the daily press but, as a matter of fact, the production of synthetic rubber in quantities is a problem yet to be solved and years will no doubt pass before there will be any artificial material capable of competing with the real rubber nature supplies. Lately it was announced that an American scientist by the name of Noble had been able to make rubber from tar by using a high-frequency current of about 500,000 volts. The description of his process was not very intelligible, but this did not prevent the announcement from being taken seriously, or apparently so, by the daily newspapers. Of course the tale found no credence among professional men here.

The unexpected length of the war has obliged the government to strictly enforce its decrees affecting raw materials. The list of those affected by national defense measures is lengthening each day. Cotton that before the war could be obtained in Bremen at 0.64 mark (0.15) per pound cannot now be obtained for less than 1.30 marks (\$0.31). When we read that Liverpool quotes cotton at 50 pennings (\$0.12) you can understand our feelings towards England. Hardly an article of merchandise has escaped the general increase of prices. Of course these increases are all due to the scarcity of raw materials. I cannot discuss the government's measures. This is prohibited. All I can say is that they were taken in the interest of the nation. Quantities of crude rubber as small as two pounds come under government supervision and must be held at the government's disposal. The same applies to all chemicals used by the rubber and many other industries. Recently an embargo was placed on calcinated magnesias.

Automobiles, cycles, motorcycles and parts have long been under an export embargo. An embargo was recently placed on exports of wire and cable making machinery.

The enormous quantities of leather necessary for the equipment and maintenance of the army and navy, and the restrictions the government has put on the use of leather, have so increased the prices of this commodity that it no longer can be used for making shoe soles and heels and similar articles. Several important rubber factories, seeing an opportunity to develop the use of rubber soles and heels, have been making experiments and now claim to have found a perfect substitute for sole and heel leather. These substitute soles are said to be a combination of felt and rubber, and the manufacturers who have developed their manufacture hope to reap good profits, at least during the war.

A topic that is receiving considerable attention at the present time is the number of sales of rubberized garments. Dutch merchants have been making throughout Germany. These garments are not believed to be of Dutch but of British manufacture and they are being offered throughout the empire at very low prices.

prices. There are factories in Holland that turn out rubberized fabrics, but the belief here is that no Netherlands factory can manufacture and sell at the prices at which the garments are being offered.

The tremendous importance of this year's agricultural crop to the nation is causing the different farming centers to take special precautions to guard against the possibility of its destruction by fire. It is hoped that this movement will be beneficial to the rubber industry. Large orders for hose are expected.

A feature of the present condition of our mechanical rubber goods trade is that most manufacturers and jobbers have no men to send out to solicit trade, while on the other hand consumers are little disposed to purchase on account of poor business conditions and the fact that no one solicits their orders.

The sugar beet crop promises to be a fairly large one, and the sugar industry should offer a good market this year for rubber mechanical goods unless the economy policy continues to govern everything. The brewing business that has always been a very large purchaser of mechanical rubber goods is very injuriously affected by present conditions. Beer has become so expensive that people can no longer purchase it as they used to. However, in view of the government's "mobilization" of metals, as we call it here, the brewers can hardly expect to get any metallic pipes and they will most certainly have to use hose. This ought to be good for the rubber industry, or at least for those who have suitable hose for sale.

Rubberized cuffs and collars are selling well, both to the military and to the civil population. This line is providing good business to rubber manufacturers able to produce it. Rubberized gaiters and rubberized garments are much used by the men in the trenches, and rubber hose is playing an important part in the trench warfare.

It is current in rubber circles here that large German rubber manufacturers and dealers in crude rubber have made contracts in neutral countries where they are collecting large quantities of crude rubber for importation to Germany immediately upon the reestablishment of peace. The object is to guard against a boom in rubber prices, possible freight shortage and other causes of delay. The government is said to have granted special permission to make foreign payments in such cases where the interest of the nation's industries is concerned.

Serious efforts are being made toward bringing about a commercial alliance with Austria-Hungary. Since the beginning of the war our allies have fought side by side with us on most of the battle fronts, and many believe that we should be united at least commercially after the war. The Dual Monarchy consumes far more rubber goods than it can produce and, although Germany has been furnishing a large percentage of the surplus demands of our ally, France, Great Britain, Russia and Italy have been selling millions of marks of rubber goods in Austria-Hungary. We believe that this should no longer be and that the Teutonic allies at war should be closer together in peace and should combine to supply their needs as far as possible.

Latest reports state that certain Belgian rubber factories have partially resumed operations. They had been closed down since the outbreak of the war.

At the general annual meeting of the Central Association of German Rubber manufacturers, which was held in Berlin recently, it was stated, regarding the financial position of the association, that the balance in hand amounted to 13,735.50 marks (\$3,269.05), as compared with 21,339.92 marks (\$5,079), balance on hand January 1, 1914. The association contributed 10,000 marks (\$2,380) for relieving the families of those killed or injured in the war. During the year the association's membership increased from 46 to 68 members. It was voted that a large portion of the available funds be invested in the national war loan. Tire standards were also discussed, and there was a vote of encouragement to the

movement for tire size standardization. A customs tariff treaty with Austria-Hungary was advocated.

Another item of rather peculiar interest I wish to mention before closing. Our troops on the Eastern front have suffered much from vermin, and, curiously enough, the rubber industry has been foremost in relieving their sufferings from this source. Our druggists' sundries manufacturers have been doing an extensive business in hard rubber vaporizers and sprayers of all types and sizes.

* * *

Professor Harries, of the Kiel University, well known as the original producer of synthetic rubber and for his writings on the subject, has been promoted to the University of Göttingen.

* * *

Your German contemporary, the "Gummi-Zeitung," recently lost one of its oldest and most faithful collaborators in the death of Mr. August Foerster, who passed away at Blasewitz, near Dresden, at the age of 78. Mr. Foerster has been contributing to the "Gummi-Zeitung" for the past 20 years.

A TIRE DEALER CONVICTED OF FRAUD.

A tire dealer in Germany who operated a tire vulcanizing shop together with a small business in old rubber, in the course of business came into possession of a tire casing which was in perfect condition except for a large hole. As he knew the tire was not old he shipped it to its manufacturer's claim department claiming guaranty money, alleging that the tire belonged to one of his customers who had only used it a short time when it "blew out," causing an accident that nearly resulted in the customer's death. The claim department of the tire manufacturing company, however, had a very efficient card index system which enabled them to discover that the tire in question had already been subject of adjustment, some three months previous. The company sent a representative to visit the dealer and receive his complaint and then filed an accusation with a public prosecuting attorney. The tire dealer was brought to trial and compelled to admit that the tire had come into his possession as "old rubber." He was sentenced to four weeks in jail and \$25 fine.

In the course of the trial it transpired that the tire company was in the habit of indexing and carefully marking in secret characters each tire returned for a refund on guaranty. The marking was done in such a manner that not even the repair man, who went over the tire carefully both inside and out, was able to discover the minuscule markings.

DANISH CABLE INDUSTRY.

Denmark is one of the largest operators of submarine cables in the world. Danish cables connect all parts of the globe. Most of these cables were manufactured in Copenhagen.

According to the Norwegian Consul-General at the Danish capital, the Danish cable industry has more than proved its value in the present world crisis. Insulated wire and cables were among the first articles placed on the embargo list by the warring nations. Before the war Germany was the greatest supplier of cables to Norway and Sweden, where electric power, and consequently cables, are extensively used. The Danish Cable & Wire Manufacturing Co., of Copenhagen, which was already supplying the needs of Denmark, has been able to cover all the demands of the Scandinavian countries since the outbreak of the war.

A wedge-shaped cushion, the sides and bottom of which are smooth, is covered on top with a sheet of rubber sponge that absorbs the perspiration of the invalid and prevents bed sores. [German patent No. 629,124. Toni Dautrelepat.]

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

WHOLESALE RUBBER WASHING.

RUBBER planters in the Far East, particularly those who are situated near forests that abound in wild rubber, have for a long time been in the habit of purchasing gum from the native collectors. At first such rubber was shipped in the condition in which it was received. Later, however, the progressive planters installed machinery for washing and drying, and were able to substantially improve the quality of the wild product. A typical instance of this planting accessory is furnished by the Kuching Trading Co., Limited, of Sarawak, Borneo.

It was formed in 1909 by J. H. Brodie, a Scotchman who had spent 6 or 8 years in Sarawak with the Borneo Co., Limited, and was thoroughly familiar with local conditions, and R. S. Hardy, an American who had spent several years in Mexico in the guayule business, together with a number of local Chinese traders.

An old "Go-Down," or storehouse, was secured and renovated, and in it were placed a small 8-inch washer and an upright engine which ran the washer by belt. The original object of the mill was to refine Borneo rubber by washing and sheeting, and then to dry it ready for shipment instead of shipping in the crude form. For a while the 8-inch washer did its work, but often with additional coolie power, for at times the stiff chunks of rubber stuck in the rolls, and the belt would slip, until a couple of coolies gave it an additional heave, forcing the rubber through the rolls.

Finally it was decided to put in real washers, and two 24-inch washers were built for the company in Singapore and a 75 horsepower engine was obtained. These washers were at that time the heaviest and largest ever used in the Far East. The company had some difficulty in installing this larger machinery, for the tubular boiler which was brought over from Singapore was quite a problem. It was landed on the dock in Kuching and fortunately the chief engineer on the steamship "Rajah of Sarawak," who purchased the boiler for the company, had foresight enough to bring over a truck to get it

steam winch onto the truck on the wharf, and then coolies with a long rope pulled the truck through the wharf storehouse to the street. Here every stray Chinaman and Malay was gathered in and pressed into service until there were 50 of them pulling the



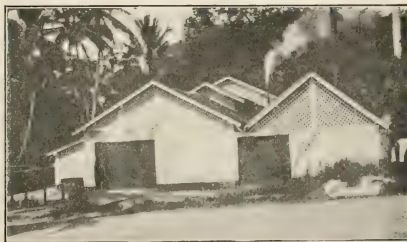
INTERIOR VIEW OF THE PLANT OF THE KUCHING TRADING CO.

boiler up to the mill, with great shouting and yelling. After much hard labor the new equipment was set going. A vacuum dryer was also installed, the first ever used in Borneo.

The company progressed finely for a time, but the advent of plantation rubber in quantity and its low price, and the falling off in use of low-priced wild rubber caused the company to drop this work and devote its attention to washing plantation rubber.

In Borneo the natives have planted many acres of *Hevea* trees in small areas—anywhere from one to one hundred acres—and scattered all over the country; and as their trees came into bearing they were able to tap and collect their latex and coagulate it; but their method of sheeting was

by rolling the coagulated latex with a bottle or a rolling pin. The company, therefore, has been a great help to them, as it now takes the coagulated latex, either buying it outright or charging so much per pound, and sheets and washes the rubber properly. Some of this rubber which the Kuching company has prepared has brought the highest price in the Singapore auctions.



THE PLANT OF THE KUCHING TRADING CO.



TRANSPORTING RUBBER TO THE DOCKS.

from the wharf up to the mill—a distance of about a mile. In Sarawak there are no horses or motor trucks; in fact, coolie labor only. The boiler was transferred from the steamer by the

AS TO FEEDING HENS ON LATEX.

In an earlier number of THE INDIA RUBBER WORLD there was an article forecasting uses for rubber, the concluding paragraph of which ran as follows: "The list grows long and this is but a beginning; there are scores of industries yet to be viewed, and, above all, the backbone of all industry—the farmer—has been neglected. Perhaps—and this is but a vague suggestion—if he raised his milk-fed hens on rubber latex, egg shells would cease to be fragile."

The "Goodrich," the sprightly publication issued monthly by The B. F. Goodrich Co., quoted quite extensively from this article in a late number and followed the concluding paragraph with this addendum: "In this connection we are reminded of certain hotel-served poultry which gave the impression that it, too, had been raised on latex, with the result that instead of producing a bounceable egg the rubber substance had become incorporated in the edible tissues."

Some Rubber Planting Notes.

COST OF PRODUCTION OF PLANTATION RUBBER.

THE Far Eastern press has of late devoted considerable attention to the question of giving greater publicity to estate costs. Opinions on the subject, of course, differ, the majority of the parties interested being opposed to the publication of costs, while a strong minority favor the publication of this information. The majority consider the cost of production of rubber as a business secret that should not be divulged, but the minority contend that rubber planting is an exceptional line of business and that it stands on a plane by itself. A correspondent of the Kuala Lumpur daily "Malay Mail" gives the following view of the question:

Rubber planting is an industry practically limited to the Dutch East Indies, Malaya and Ceylon. There are rubber plantations in East Africa and in a few other parts of the globe, but their combined output is so small that their existence does not affect the question. Large sums of money have been secured from thousands of shareholders and invested in rubber plantations. The Far Eastern plantation industry has led to a change in government policies. It concerns not only investors but the world in general, occupying a unique position not to be compared with general industries.

Though admitting this, there are many people who still maintain that it would not be a good thing to publish "all-in" costs. "Why," they ask, "should the whole world know our costs in producing rubber?" The "Malay Mail's" correspondent believes that the adoption by all of the practice of publishing costs would lead to greater economic stability—that the competitive element has to exist to produce the best results and that the competitive test can be safely applied to rubber estate work. The industry is, comparatively speaking, a young industry, with much to learn. The boom days are over, and prices are lowering to a more natural level. The successful estate manager is reducing his costs to a minimum by improved methods in tapping and by improvement in the yields obtained. If every estate published its costs, this economy should act as an incentive to those still producing on a fairly high scale.

Another point is that the vast number of shareholders who have invested in rubber naturally want to know, not only what the output has been and what profit has been made, but what was the cost of production. But there should be uniformity of accounts. It is difficult accurately to apportion estate charges. The average estate is planted in sections, and the rubber is in varying stages of development. If the whole estate is to bear the "all-in" costs, it is obvious that the sections of it that are not in bearing are going to consume a large amount of money without giving any output return. The accounts should be made separately for each section, so that it could be ascertained what the actual cost of working each section is. But where the whole estate is in bearing, and all estate and managerial items are chargeable against the rubber harvested, there is no reason why the cost per pound of rubber could not be published with beneficial results.

PARA RUBBER IN THE BRITISH GOLD COAST COLONY.

The government of the British Gold Coast recently published a report on the agricultural department of the colony which contains some interesting items regarding experiments conducted in the department's experimental stations at Tarquah and Coomassie with Para and *Funtumia*.

At Tarquah two lots of *Hevea* trees, of 15 trees each, have been tapped continuously on the half-spiral and half-herring-

bone systems since March, 1910. The total average yield per tree from the two systems is 17 pounds, 4 ounces and 14 pounds, 10½ ounces, respectively, showing a yield of over 2½ pounds per tree in favor of the herring-bone system. The herring-bone system employed consisted of three half-herring-bone cuts at about 20 inches apart on one-third of the circumference of the tree. It was found that the bark on this one-third of the tree was used up after 16 months continuous tapping, so that the original bark would last four years, at the end of which time the new bark would be sufficiently strong to be retapped. Experiments proved that better results are obtained from renewed bark than from the original bark.

The estimated cost of production for rubber produced on the department's experimental stations was from 9 to 11d. per pound, so that the rubber produced was sold at a profit in spite of the low rates prevailing in the crude rubber market.

Experiments conducted with *Funtumia* trees, which are tapped in the full herring-bone fashion, showed that the *Funtumia* is not a good rubber plantation tree, for the yields were small for first tappings and even smaller for second tappings, the only redeeming feature being the lower cost of collecting and preparing the rubber, which was 2½d. per pound for the first tapping and 4½d. for the second tapping. *Funtumia* grows more slowly than *Hevea*, it develops a poor root system and is easily uprooted by storms. Pests gave the Gold Coast experimental stations but little trouble except when the trees were young.

RUBBER EXPORTS FROM MOZAMBIQUE.

During the year 1913—the latest period for which statistics are available—the exports of rubber from Portuguese Mozambique amounted to 17,906 pounds.

RUBBER PLANTING IN BRITISH GUIANA.

Mr. C. K. Bancroft, assistant director, Department of Science and Agriculture, British Guiana, recently contributed an interesting article on Para rubber planting in British Guiana to the "Daily Argosy," of Georgetown, British Guiana.

The writer states that the cost per acre of bringing Para trees into bearing amounts to about £40 [\$194.66]. From experiments in tapping 379 trees five and a half years old, and 300 trees six and a half years old at the Issororo experiment station, he deduces that the cost of collecting rubber from trees growing under suitable conditions would average slightly less than seven cents per pound dry rubber. He believes that these experiments, though they were conducted on a small scale, demonstrate that plantation rubber can be produced at a profit in British Guiana with Para plantation rubber selling on the market at 48 cents per pound, and that the average profit per acre would be in the neighborhood of \$144 per annum.

DROUGHT IN NORTHERN BRAZIL.

The states of Ceara, Parahyba and Rio Grande do Norte, in Northern Brazil, are suffering from a very severe drought. The stricken districts furnish annually a large contingent of rubber gatherers who are now in a condition of famine and totally unable to equip themselves or to pay for their transportation to the rubber districts. As the Brazilian government subsidizes the lines of steamships running up the rivers to the forests in the interior it is suggested, in influential circles in Northern Brazil, that the government should furnish free transportation to those desiring to go into the rubber country.

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

Interesting Letters from Brazil.

THE RUBBER SITUATION ON THE AMAZON.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

THE present low price of rubber, as we have predicted, has not affected the industry on the Amazon very much. The Amazon will always be able to compete with Ceylon in prices, as we have already said. The Amazon will not be removed as a producer of rubber. As cheap as they may be able to produce their rubber, the Amazon will be able to produce it still cheaper. The middlemen, however, who are many, between producer and consumer will earn less profit. The proof of this is that during 1914 and 1915 there were very few failures recorded on the Amazon, and these in small amounts.

Practically the whole business is now conducted on a cash basis. The war has cut off their former supplies from England, Germany and the other belligerent countries with which they had a 3-to-6 months' credit. Since the Amazon is compelled to import the necessities of life, it is obliged to purchase goods from the United States. The commission houses and the manufacturers, although very anxious to get Amazonian trade (the National City Bank not yet having established an institution which could be of great help to them in ascertaining the credits), are exporting goods to them for cash only. The Amazonian importers buying for cash have no other course than to supply the *aviadores* for cash, who in their turn send goods to the rubber centers in the interior only upon the receipt of the rubber for the goods bought. In many instances a clerk of the *aviadores* goes along with the boat carrying the goods, to exchange them for rubber and other products.

The war of course has been very bad for all business and also for the Amazon, but at the same time it has taught the Amazon a good lesson. On account of the great risk it has removed the entire credit system by means of which they could overcharge 50 to 80 per cent. on the goods.

Everybody was squandering money in going to Europe and buying all kinds of useless paraphernalia. Some bought boats at \$100,000, which, after being used once or twice a year, would remain idle the rest of the time. Now they are working on a real business basis. The rubber producer is taking from the *aviadores* only those goods which he must take and which he cannot raise on his estate. Formerly he was supplied with beans, rice, corn, canned stuff, etc., in order to make profit. These he could easily raise on his estate by farming, raising cattle, chickens, etc. Now he is actually doing these very things.

For these reasons it is my opinion that the Amazon, barring all other obstacles including the 22 per cent. duty to the government, can still compete with the East. There is no doubt that Para rubber is much better than Ceylon rubber for the manufacturer. Ceylon claims, however, that she supplies a rubber that is 25 per cent. richer than Para rubber because of the loss in washing. This will easily be overcome. It is already realized, and all steps are being taken to cure the rubber in such a way as to obviate this loss and yield the same purity of rubber as Ceylon claims to produce.

The speculation in rubber on the Amazon is altogether shameful. In many instances the price here in New York is much lower than that paid by some export houses in Para. According to the present outlook sales at that port will be largely for future delivery. Though they do not have the rubber nor even have it in view, some Para exporters sell for future delivery at a much lower price than is actually quoted in the New York market. Of course, should the quotation rise, they are liable to be badly caught. They do not take this into consideration, but continue to lower the price with every sale.

As we stated above, the commerce is becoming more and more stable, since earning less they spend less. The government which calculates its budget from the former price or the prevailing price has a greater deficit each year and is seeking a way to regulate this, from which originate the valorization schemes. In attempting to improve this situation the state gets in touch with the Federal government, which, being already interested in other products, mixes them all up together, and brings forth a valorization plan which, while suitable to some, cannot be suitable to all. At any rate the entire thing will bring confusion and the men who will suffer will be the same rubber exporters.

The low price of rubber renders the income of the country less. For this reason they are trying to increase it by paying more attention to other products, especially hardwoods with which the forests of the Amazon are full, and which are very valuable and cannot be gotten in any other country. All other timber is also to be found there, and will surely be in demand after the war ceases.

MIGUEL P. SHELLEY.

PLANTING HEVEA ON THE AMAZON.

The following paragraphs are taken from a letter, which recently appeared in a paper published in Manaus, written by the owner of an estate near the mouth of the Purus River, some miles above Manaus, who is planting rubber extensively and apparently with a good deal of enthusiasm.

"On reading the message of the Governor of the State, in that interesting part where he treats of the means of encouraging the planting of *Hevea* in our State, I could not resist the duty of associating myself with this excellent train of thought, seeing that in my opinion the planting of *Hevea* is one of the surest means of assuring the future prosperity of the Amazon. I have, in fact, already planted many thousand rubber trees and am still continuing to do so.

"In addition to the recommendations of the Governor's message it would be specially useful, Mr. Editor, if the authorities of the interior were instructed to insist upon *Hevea* being planted when State lands are encroached on and cleared for planting cassava. These clearances are abandoned after making the floor, and fresh forest is cleared for the ensuing year, leaving the former clearing to become overgrown again with jungle, while it would be so simple to plant *Hevea*, seeing that one man can plant a thousand trees in a day.

"It is thus that our forests are getting cut down without any permanent advantage to ourselves, and to the detriment of our children.

"If a man puts in a day's work planting a thousand rubber trees among his cassava, it is by no means a day lost, as cleaning out the weeds and undergrowth benefits the cassava as well, and when the cassava is pulled up at the end of the year, the land remains fairly clean for another six months, which gives the *Hevea* a start of eighteen months and a growth of ten feet in height, so that it runs no risk of getting caught up and choked by the jungle afterwards.

"By adopting this plan I myself have rubber trees five years and eight months old, with a circumference of 110 centimeters at the base, that could already be tapped by modern methods."

NEW CRUDE RUBBER FIRMS AT PARA AND MANAOS.

The firms of Zarges, Berringer & Co. and Zarges, Ohliger & Co., which have dealt extensively in crude rubber in Para and Manaus, and from which the capital and interests of E. A. Zarges and Heibut, Symons & Co., of London and Liverpool, were withdrawn on December 31 last, have been succeeded by Berringer & Co. and Ohliger & Co., who will continue the business. F. C. A. Berringer and Hugo Ohliger are joint partners in the new firms, the former of which will have its headquarters at Para, the latter being located at Manaus. A circular issued on August 4 names F. W. F. E. Paschen as their authorized representative in those cities, with full power of attorney.

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED AUGUST 17, 1915.

- N**O. 1,150,007. Water-proof treatment of leather. A. McLennan, Ross Hereford, England.
- 1,150,065. Dipping blocks comprising rubber covered resilient layer. H. T. Rosen, Walkerton, Ind.
- 1,150,120. Stocking supporter. M. L. Irwin, Philadelphia, Pa.
- 1,150,223. Wheel and tire. M. C. Overman, New York, N. Y.
- 1,150,460. Life preserver. J. Schreiber, Lincoln, Ill.
- 1,150,508. Respiratory mask or helmet. A. B. Dräger, Lübeck, Germany.
- 1,150,517. Game. M. L. Hawks, New York, N. Y.
- 1,150,540. Drying apparatus. J. O. Ross, assignor to B. F. Sturtevant Co., both at Boston, Mass.
- 1,150,593. Corset. J. Goldberg, New York, N. Y.
- 1,150,642. Process of manufacturing condensation products from formaldehyde and phenol. H. Stockhausen, Crefeld, and Reinhold Grühl, Charlottenburg—both in Germany.
- 1,150,776. Fishing bait box. P. Lamb, Englewood, Colo.

Trade Marks.

- 77,605. Bowers Rubber Works, San Francisco, Cal. The word *Victor*. For rubber hose, belting and composite rubber piston packing.
- 78,639. Charles Niedner's Sons Co., Malden, Mass. A color line longitudinally disposed upon the goods and incorporated in the fabric and formed of a central stripe of three red warps alternating with two yellow ones, and on either side a broken stripe of two green warps contiguous to the yellow stripes. For linen hose.
- 78,640. Charles Niedner's Sons Co., Malden, Mass. A color line running longitudinally and incorporated in the fabric. For linen hose.
- 81,626. Boston Rubber Shoe Co., Malden and Boston, Mass. The word *Nugget*. For rubber boots and shoes.
- 83,663. Montgomery Ward & Co., Inc., New York, N. Y. Diamond shape design with the initials *M* and *W*. For rubber balls and general sporting goods line.
- 86,182. B. E. Nevin, Mercedburg, Pa. Representation of a pneumatic tire with *Sofat* performing repairs. A semi-liquid or cement seal for rubber tires.
- 86,501. Wyckoff & Lloyd Co., Springfield, Mass. The word *Lotus*. For rubber and fibrous packings and rubber hose.
- 86,595. York Manufacturing Co., York, Pa. The words *York Co.* For rubber packing.
- 87,405. The Worthington Ball Co., Elyria, Ohio. The word *Trey*. For golf balls.
- 87,463. The Goodyear Tire & Rubber Co., Akron, Ohio. Representation of a ball with the word *Os-Lite* through the center. For leather floor and rubber soles and heels.
- 87,736. Hood Rubber Co., Watertown, Mass. Representation of a horse-shoe. For rubber boots and shoes and tennis shoes having rubber soles vulcanized to the shoe.

ISSUED AUGUST 24, 1915.

- 1,150,922. Apparatus for vulcanizing tire shoes. C. F. Adamson, East Palestine, Ohio, assignor to the United States Rubber Co., New York, N. Y.
- 1,150,930. Watch protector. L. Cohn, New York, N. Y.
- 1,150,986. Tire for vehicles. H. Besser, Alpena, Mich.
- 1,151,086. Rim construction for dual tires. J. C. Cole, assignor to Fisk Rubber Co.—both of Chicopee Falls, Mass.
- 1,151,093. Toy balloon. A. H. Du Bois, New York, N. Y.
- 1,151,133. Tire. C. B. Steele, New York, N. Y.
- 1,151,144. Artificial foot comprising a pneumatic sack. J. E. Wofe and T. Browning, both of Cassville, Va.
- 1,151,227. Packing. C. E. Stokes, Trenton, N. J.
- 1,151,319. Insulated wire stripping device. S. G. Wood, Brooklyn, N. Y.
- 1,151,396. Inflated ball. F. T. Roberts, Trenton, N. J.
- 1,151,511. Shoe heel. E. W. Burr, Boston, Mass.

Design.

- 47,763. Hot water bottle. B. F. Stauffer, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

Trade Mark.

- 87,152. Nedham Tire Co., Nedham, Mass. Illustration of a spear with the word *Nedham*. For rubber and rubber and canvas tires.

ISSUED AUGUST 31, 1915.

- 1,151,604. Pneumatic tire. W. S. Mummary, Minot, N. D.
- 1,151,797. Horseshoe. W. J. Kent, New York, N. Y.
- 1,151,859. Sectional air bag. J. P. Brophy, Birmingham, Ala.
- 1,151,924. Steam vulcanizer. E. N. Brown, Cleveland, assignor of one-half to J. G. Gore, both in Cleveland—both in Ohio.
- 1,151,980. Feed plug for a fountain pen. De Witt C. Van Valer, Richmond Hill, assignor to Modern Pen Co., New York—both in New York.
- 1,152,067. Toy comprising elastic cord. E. Allison, San Francisco, Cal.
- 1,152,115. Dancing shoe with rubber sole pad. D. McCormick, Columbus, Ohio.
- 1,152,185. Spading plate for waterproof footwear. K. F. W. Koch, Chicago, Ill.

- 1,152,246. Battery cell with vulcanized rubber lining. W. L. Walker, Groton, Conn.
- 1,152,247. Battery jar. W. L. Walker, New London, Conn.
- 1,152,257. Vulcanizing apparatus. C. M. Beardsley—Harriet Marion Beardsley, administratrix—Cleveland, Ohio.
- 1,152,276. Pressure gage with a rubber air chamber. J. A. Bowden, Los Angeles, Cal., assignor to A. Schneider's Son, Inc., Brooklyn, N. Y.
- 1,152,284. Arch support for shoes. P. Broadbends and L. E. Smith—both of Batavia, N. Y.
- 1,152,317. Dental vulcanizing flask. E. A. Hewes, Eskbank, Dalkeith, Scotland.
- 1,152,324. Rubber tire. A. S. Krotz, Janesville, Wis.
- 1,152,349. Waterproof fabric and process of manufacture. H. Swain, San Francisco, Cal.
- 1,152,372. Manufacture of seamless rubber articles. T. W. Miller, assignor to The Faultless Rubber Co.—both of Ashland, Ohio.

Design.

- 47,771. Vehicle tire. M. Bergegnan, Paris, assignor to Société Générale Des Etablissements Bergegnan, Clermont Ferrand, Puy-de-Dôme—both in France.

Trade Mark.

- 83,461. Hooley Hill Rubber & Chemical Co., Hooley Hill, near Manchester, England. The word *Accelerene*. For a chemical substance for use with india rubber during the process of vulcanization.

ISSUED SEPTEMBER 7, 1915.

- 1,152,470. Vehicle tire. F. U. Adams, Hastings-upon-Hudson, N. Y.
- 1,152,508. Puncture proof wheel. W. J. Higgs, Lehi, Utah.
- 1,152,543. Demountable felly-band for vehicle wheels. J. E. Perrault, Belmont, assignor to Hood Rubber Co., Watertown—both in Massachusetts.
- 1,152,584. Machine for operating on shoe soles. E. E. Winkley, Lynn, Mass.
- 1,152,595. Invalid's corset. J. M. Bodensick, assignor of one-third to G. O. Bodensick—both of New York, N. Y., and one-third to F. Brooker, Brooklyn, N. Y.
- 1,152,601. Fountain pen filler. H. N. Carpenter, Woodford, Vt.
- 1,152,602. Fountain pen filler. H. N. Carpenter, Woodford, Vt.
- 1,152,609. Pneumatic spring. B. W. Davis, Phillips, Wis.
- 1,152,636. Sprinkler. H. E. Houston, Wichita Falls, Tex.
- 1,152,652. Hose nozzle. J. McElroy, Oakland, Cal.
- 1,152,657. Tire structure. J. Pionkowski, Cleveland, Ohio, assignor of three-eighths to S. Jasielewski, one-eighth to J. Yablonski, and one-eighth to M. Grayce.
- 1,152,672. Hose supporter. T. P. Tuite, New York, N. Y.
- 1,152,753. Garment supporter. B. F. Orewiler, Chicago, Ill.
- 1,152,756. Elastic tire for vehicle wheels. L. T. Petersen, assignor to The Republic Rubber Co.—both of Youngstown, Ohio.
- 1,152,779. Tire. H. Behn and J. Vene, assignors of one-fifth to H. Behn, one-fifth to J. Vene, one-fifth to W. Marks, one-fifth to G. J. Streisel, Sr., and one-fifth to C. C. Mair—all of Elizabeth, N. J.
- 1,152,791. Switch throwing mechanism. R. V. Collins, assigned to Royal Engineering Corporation—both of New York, N. Y.
- 1,152,830. Elastic vehicle tire. T. Midgley, Worthington, Ohio, assignor to Morgan & Wright, Detroit, Mich.
- 1,152,834. Process of manufacturing articles from plastic materials. R. B. Price, Mishawaka, Ind.
- 1,152,835. Process of treating plastic materials. R. B. Price, Mishawaka, Ind.
- 1,152,836. Process of treating combined plastic and fabric articles. R. B. Price, Mishawaka, Ind.
- 1,152,837. Process of treating plastic materials. R. B. Price, New York, N. Y.
- 1,152,838. Method of making vulcanized rubber products. R. B. Price, New York, N. Y.
- 1,152,887. Inner sole. E. C. Donnell, Brockton, Mass.
- 1,152,902. Vehicle tire comprising an inner tube. M. Perez, Chicago, Ill.
- 1,152,906. Auto tire. J. A. Read, Arlington, N. J.
- 1,152,929. Garment supporter. L. E. Berebaum, Chicago, Ill.
- 1,152,935. Process of producing compounds of rubber and steel wool. J. P. Cron, Chicago, Ill.
- 1,152,938. Eraser holder for typewriting machine. B. F. Fortin, Hartford, Conn., assignor to Underwood Typewriter Co., New York, N. Y.
- 1,152,966. Wheel comprising a pneumatic tire. D. H. Padden, Chicago, Ill.
- 1,152,978. Tubing machine. V. Royle, Paterson, N. J.
- 1,152,981. Force cup comprising an elastic cup body. W. F. Schacht, Huntington, Ind.
- 1,152,993. Vulcanizer. P. D. Thropp, assignor to The De Laski and Thropp Circular Poven Tire Co.—both of Trenton, N. J.
- 1,153,002. Joint for hose connections. A. M. Wright, Bloomington, Ill.
- 1,153,026. Tire pressure gage. R. A. Campbell, Minneapolis, Minn.
- 1,153,030. Diver's dress consisting of a shirt or jacket and separate trousers. F. L. Claren, assignor to the F. L. Drägerwerk, Heintz, and Bernh. Dräger—both of Lübeck, Germany.
- 1,153,040. Process and apparatus for purifying caoutchouc. H. Debaugé, Paris, France.

- 475,975 (August 10). Substance to render air tubes serviceable in spite of their porosity and punctures. F. D. Belfrage.
- 476,013 (August 14). Elastic tire for wheels. W. C. Wreen and J. J. Harrigan.
- 476,036 (March 31). Improved elastic tire for vehicle wheels. A. Bonmar.
- 476,116 (August 28). Improvements made on apparatus for feeding fabric winding machines, especially for machines used by manufacturers of pneumatic tire fabrics. The Miller Rubber Co.

THE GERMAN EMPIRE.

PATENTS ISSUED (With Date of Validity).

- 287,094 (January 13, 1915). Needle holder for medical injection apparatus. Gustav Rudolf Schimmel, Detroit, U. S. A., represented by E. W. Hopkins, patent lawyer, Berlin SW 11.
- 287,093 (October 10, 1914). Liquid vaporizer. (Supplement to patent No. 284,980.) Karl Heinicke, Reichswaldallee, 7, Dusseldorf.
- 287,110 (October 4). Process for attaching rubber heels to shoes. Julius Bahnen, Kaiserlautern, Pfalzstrasse.
- 287,150 (June 13, 1913). Sewing machine for surgical purposes. Essbach, Klingenthal.
- 287,203 (June 5, 1914). Nozzle for hose and tubes, especially adapted to garden hose. Richard Schulz, Berlin-Strasse, 151 Berlin-Lichterfeld.
- 287,209 (July 19). Machine for manufacturing sheets from fibrous materials and cement; for instance, asbestos or cardboard or the like and cement. Bircher and Pfug, Zurich, Switzerland. Represented by Messrs. G. Dedreux, A. Weickmann and H. Kaufmann, patent lawyers, Munich.
- 287,382 (December 17, 1913). Nursing bottle with reinforced neck for the nipple. Carl Cade, Hollandstrasse 10, Herford-in-Westphalia.
- 287,478 (July 17, 1914). Hose or tube jet having a plurality of small holes; also machine for manufacturing it. Supplement to Patent No. 265,318. Dr. Carl Veltman, Kunsnacht, near Zurich, Switzerland.
- 287,526 (September 24). Press for stamping leather and similar materials in which the stock is automatically fed to the press. United Shoe Machinery Co., Paterson, N. J., and Boston, Mass., U. S. A.; represented by Messrs. K. Hallbauer and A. Bohr, patent lawyers, Berlin SW 66.
- 287,547 (October 21). Interchangeable rubber heel. Otto Goltzsch, Glatz in-Silesia.

RUBBER TIRES IN BRAZIL.

The use of auto-mobiles in Brazil is continually on the increase. Yet every tire has to be imported. The tire imports from the United States for the year 1914 amounted to but three per cent. of the total, the tire trade of Brazil for 1914—as shown by the value of its imports—being distributed as follows:

BRAZILIAN IMPORTS OF TIRES FOR 1914.

	Value.
France	\$188,247
United Kingdom	100,965
Belgium	79,638
Germany	74,131
United States	15,714
Italy	11,416
All other countries	6,975
Total	\$477,086

As foreign automobile tire manufacturers are largely occupied in furnishing tires to the countries at war, American manufacturers have at present an exceptional opportunity for introducing their tires in Brazil.

CHILEAN IMPORTS OF RUBBERIZED FABRICS.

It cannot be said that Chile offers a very extensive market for rubber goods, but at the same time American exports to that country ought to be much larger than they are. While eight months of the year are practically dry in Chile, during the four winter months there is quite a fall of rain, the average yearly rainfall at Valparaiso being 35 inches. The statistics for 1913, which are the latest available, show that out of an importation of over 32,000 pounds of rubberized cotton fabrics, only 44 pounds were exported from the United States. The statistics in detail are as follows:

During 1913 Chile imported 32,557 pounds of rubberized cotton fabrics valued at \$18,857, of which Great Britain furnished 20,000 pounds valued at \$11,579; Germany 8,937 pounds, worth \$5,180; France 3,510 pounds, worth \$2,034, and the United States only 44 pounds, worth \$26. The total imports of woolen rubberized fabrics amounted to 2,168 pounds, valued at \$4,304, of which 1,526 pounds, worth \$3,031, came from Great Britain. Germany and France furnished smaller quantities, and the United States only 49 pounds, valued at \$96.

UNITED KINGDOM RUBBER STATISTICS FOR MONTH ENDING AUGUST 31, 1915.

IMPORTS.

	1914.		August.		1915.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Crude Rubber:						
From						
Dutch East Indies	280		280	\$349,580		
Dutch West Africa	25	\$2,557	25	26,518		
Gold Coast	11	8,770	26	13,475		
Other countries in Africa	66		66	152,380		
Penn	25	4,287	25	26,537		
Brazil	363	450,594	737	882,175		
British India	38		38	48,134		
Straits Settlements: Dependencies						
Labuan	1,558	1,748,300	2,012	2,531,699		
Federated Malay States	798	957,284	1,069	1,342,098		
Malaya and dependencies	686	791,361	863	1,026,773		
Other countries	490	421,620	124	30,596		
Total	3,401	\$4,399,793	5,265	\$6,429,965		
Gutta percha	123	\$128,529	340	\$241,262		
Waste and reclaimed			304	\$55,254		
Manufactures:						
Apparel, waterproofed:						
Boots and shoes—dozen pairs	744	\$13,606		\$1,285		
Insulated wire		10,731	18,546	77,502		
Submarine cables		16,673		37,219		
Motor tires and tubes		78				
Motor tires and tubes		136,267		801,665		
Motorcycle tires and tubes		14		44,120		
Cycle tires and tubes		3,334		23,014		
Tires not specified		438		17,432		

EXPORTS, UNITED KINGDOM.

Imports of Manufactures, by Country, United Kingdom				
	1914.	August.	1915.	
	Quantity.	Value.	Quantity.	Value.
Waste and reclaimed			445	\$13,631
Manufactures—				
Apparel, waterproofed:				
France		\$1,484		\$6,419
British South Africa		12,303		26,484
British East Indies		1,285		3,513
Australia		6,949		8,015
New Zealand		5,640		11,957
Canada		8,346		38,006
Other countries		127,731		74,691
Total		\$237,738		\$159,285
Boots and shoes—dozen pairs	29,531	\$44,124	5,366	\$26,688
Insulated wire		96,449		100,649
Submarine cable		146		226,599
Motor tires and tubes		107,433		193,390
Motorcycle tires and tubes		2,060		8,076
Cycle tires and tubes		63,352		154,054
Tires not specified		38,582		45,940
Manufactures not specified		328,523		405,740

EXPORTS, FOREIGN AND COLONIAL.

Unmanufactured				
Crude rubber:				
To Russia	28	\$36,031	768	\$912,157
Germany	201	329,282		.....
Belgium	109	123,565		.....
France	209	272,033	509	654,802
United States	975	1,116,667	2,419	3,152,874
Other countries	103	115,321	559	725,000
Total	1,715	\$1,992,929	4,255	\$5,444,893
Gutta percha				
	14	\$18,191	46	\$41,121
Waste and reclaimed				
			8	2,964
Manufactures:				
Apparel, waterproofed	131			6,963
Boots and shoes—dozen pairs	98	774	54	7,636
Insulated wire		433		477
Motor tires and tubes		28,712		265,292
Motorcycle tires and tubes		1,757		4,234
Cycle tires and tubes		3,786		1,397
Tires not specified		238		3,304

* Included in rubber prior to 1915.

† 1914 "Rubber" is shown under separate headings of "Raw" and "Waste" and "Reclaimed."

OUTPUT OF DUTCH RUBBER COMPANIES.

The United States Consul-General at Amsterdam, Holland, writes that reports to date of Dutch rubber producing companies show that for the first seven months of 1915 the product of these companies was much greater than for the corresponding period of 1914, and about equal to the total product of 1913.

The same consular officer reports that on August 31 the Royal Netherlands Steamship Co. began to operate steamers between Amsterdam and Callao, Peru, and Valparaiso, Chile, via the Panama Canal. Sailings will be monthly, and six or seven of the company's 50 steamers will be devoted to this service.

Sever, M. 1995. 1. 10. 94.

July, 1915.

1915.

EXPORTS OF AUTOMOBILE TIRES BY COUNTRIES

EXPORTS OF FOREIGN MERCHANDISE

The Quantity Is Given in Packages.

(All contents are given in packages unless otherwise specified.)

June 1 to July 31, 1915.

MANUFACTURES.		REFRIG. GOODS NOT SPECIFIED.		HARD.		PACKING.		TREES SHEDDED.		TREES.		RUBBER.		CEMENT.	
TO—	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
Men	832	\$56,778	6	\$1,019	112	\$41,396	...	...	...	...	...	...	...	...
Africa	541	\$5,769	18	21,476	...	...	...	...	...	...	...	...	106	\$1,988
Argentina	1,440	79,148	9	479	...	...	...	...	...	...	...	...	...	...
Australia	690	40,301	3	243	...	...	...	...	...	...	...	...	...	...
British Guiana	36	...	4	309	...	...	...	...	...	...	...	...	...	...
Canada	30	8,605	31	2,402	...	...	...	...	...	...	...	...	...	...
Central America	772	39,334	40	5,444	...	...	...	...	...	...	...	...	...	...
Chile	501	21,350	12	1,337	...	...	...	...	...	...	...	...	...	...
China	136	4,524	...	204	...	...	...	...	...	...	...	...	...	...
Colombia	60	4,827	...	...	...	...	...	...	...	...	...	...	...	...
Costa Rica	186	...	...	...	...	...	...	...	...	...	...	...	...	...
Curaçao	1	1,250	...	...	...	...	...	...	...	...	...	...	...	...
Dutch Guiana	124	8,435	...	...	...	...	...	...	...	...	...	...	...	...
East Indies	58	...	...	...	...	...	...	...	...	...	...	...	...	...
Ecuador	1,371	51,515	...	...	...	...	...	...	...	...	...	...	27	807
France	7,687	473,207	...	...	...	...	...	...	...	...	...	...	...	...
Great Britain .....	...	659	...	...	...	...	...	...	...	...	...	...	...	...
Greece	186	3,924	...	...	...	...	...	...	...	...	...	...	...	...
Holland	35	1,118	...	...	...	...	...	...	...	...	...	...	...	...
India	2,091	66,317	...	...	...	...	...	...	...	...	...	...	...	...
Italy	100	5,476	...	...	...	...	...	...	...	...	...	...	...	...
Japan	145	452	...	...	...	...	...	...	...	...	...	...	...	...
Java	115	12,982	...	...	...	...	...	...	...	...	...	...	...	...
Mexico	113	8,328	...	...	...	...	...	...	...	...	...	...	...	...
New Zealand	28	26,916	...	...	...	...	...	...	...	...	...	...	...	...
Norway, Sweden, and Denmark	12	12,056	...	...	...	...	...	...	...	...	...	...	...	...
Peru	14	14,530	...	...	...	...	...	...	...	...	...	...	...	...
Philippines .....	...	194	...	...	...	...	...	...	...	...	...	...	...	...
Portugal .....	...	10,586	...	...	...	...	...	...	...	...	...	...	...	...
Russia	13	820	...	...	...	...	...	...	...	...	...	...	...	...
Siam	6	796	...	...	...	...	...	...	...	...	...	...	...	...
Singapore .....	...	7,197	...	...	...	...	...	...	...	...	...	...	...	...
Spain .....	...	188	...	...	...	...	...	...	...	...	...	...	...	...
Switzerland .....	...	311	...	...	...	...	...	...	...	...	...	...	...	...
Turkey in Asia .....	...	6,166	...	...	...	...	...	...	...	...	...	...	...	...
Uruguay	48	9,200	...	...	...	...	...	...	...	...	...	...	...	...
Venezuela	1,138	13,130	...	...	...	...	...	...	...	...	...	...	...	...
West Indies .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total .....	...	\$1,271,580	...	\$43,283	...	\$16,147	...	\$31,829	...	\$329	...	\$5,680		
UNMANUFACTURED		GROSS RUBBER		GALATTA		RUBBER SUBSTITUTES		RECLAIMED RUBBER		RUBBER S-KAY		RUBBER S-KAY		RUBBER S-KAY	
TO—	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
Australia .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Great Britain	51,868	\$29,568	10	\$15,840	...	...	...	...	...	...	...	...	...	...
Japan .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total .....	...	\$29,568	...	\$15,840	...	...	...	...	...	...	...	...	...	...

Review of the Crude Rubber Market.

NEW YORK.

SEPTEMBER 30, 1915.

EARLY in the month spot quotations were steady but futures were unsettled and prices nominal. The market was quiet and buying confined to special lots at figures that reflected the far from normal condition of the market. There was a noticeable lack of real demand and as supplies were plentiful the natural result was easier prices. On September 7, First latex spot was quoted at 58½ cents, and Upriver fine at 56 cents, although sales at 54 cents were reported.

There was no change noted during the first two weeks of the month. Inquiries were plentiful, but the volume of actual buying was not up to the hopeful expectations for big September business.

About September 16 the market developed a firmer tone and continued strong until the 20th, when higher prices were recorded for plantations, First latex and Smoked sheet spot selling at 59 cents, while Upriver fine had fallen off and was quoted at 55½ cents.

The market stiffened up during the last week of the month and considerable interest developed in futures, particularly for October and December. A fair business in Pará sorts was done and Upriver fine, November and December delivery was sold at 54 cents. The market continued firm and the month closes with First latex spot, selling at 60 cents and Smoked sheet at 59½ cents, while Upriver fine is offered at 55 cents.

The Booth Line steamer "Francis" is now due with 180 tons of rubber. The steamship "Atahualpa" of this same line, with 100 tons from Iquitos, will receive rubber at Manaós and Pará, arriving in New York October 10.

LONDON.

Early in September there was marked activity in buying orders for all spot and future grades, which developed a steady market and firm prices. Sales of First latex, spot, were made at 2s. 4¼d. Smoked sheet, spot, was selling at 2s. 4¼d. Hard Pará was steady at 2s. 4¼d.

There was little change as the month progressed and excepting the usual fluctuations of a quiet market there was little to record. By the middle of the month prices had eased off. First latex and Smoked sheet, spot, were quoted at 2s. 4d. and Hard Pará was easy at 2s. 4¼d. Considerable interest developed in plantations during the fourth week of the month and resulted in a firmer and more active market. First latex, spot, was selling at 2s. 4¼d. and Smoked sheet, spot, was quoted at 2s. 4¼d.

A small increase of 249 tons is shown in London stocks at the end of August, 1915. Imports were 3,901 tons and deliveries were 3,652. Total imports for the eight months were 43,490 tons, and deliveries were 44,084 tons.

PARÁ AND MANAÓS.

Recent reports from Manaós indicate that arrivals in July and August of this year were large, and for September and October they are expected to be above the average. If a large crop should be realized and exchange remain at a low figure, it would mean a prosperous year for the Amazon valley. With exchange at 12d. (24 cents) as compared with 16d. (32 cents) the rate before the war, the Amazon exporter can do business at remunerative prices.

Receipts at Pará were 2,245 tons in August against 1,290 tons in July and 1,620 tons a year ago. The total for eight months was 24,575 tons against 25,610 tons. The decrease was entirely in caucho. The Amazon crop year ended June 30, and 35,305 tons were produced against 39,115 tons in 1913-14, a decrease of 3,810 tons. The difference is due to the falling off in the output of caucho.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and September 30, the current date:

PARÁ.	Oct. 1, '14	Sept. 29, '15.
Upriver, fine, new.....	63 @ 65	57 @ 54½ @ 55
Upriver, fine, old.....	66 @ 68	58 @ 56 @ 57
Islands, fine, new.....	48 @ 50	50½ @ 50
Islands, fine, old.....	50 @ 52	52 @ 52
Upriver, coarse, new.....	44 @ 45	43 @ 41½ @ 42
Upriver, coarse, old.....	45 @ 46	43½ @ 43
Islands, coarse, new.....	28 @ 28	28 @ 27
Islands, coarse, old.....	28 @ 28	28 @ 28
Cameta.....	28 @ 28	28½ @ 28
Caucho, upper.....	44 @ 45	42½ @ 43
Caucho, lower.....	41 @ 43	40 @ 41
PLANTATION HEVEA.		
Smoked sheet ribbed.....	63 @ 64	58½ @ 59
First latex crepe.....	61 @ 62	59 @ 60
Forward.....	59 @ 60	59½ @ 60
Fine sheets and biscuits smoked.....	59 @ 60	57 @ 58
CENTRALS.		
Corinto.....	40 @ 42	40 @ 39
Esmeralda, sausage.....	40 @ 41	40 @ 38½ @ 39
Nicaragua, scrap.....	40 @ 41	38 @ 39
Mexican plantation, sheet.....	35 @ 45	38½ @ 39
Mexican, scrap.....	39 @ 41	40 @ 39
Mexican, slab.....	24 @ 29	28 @ 28
Manitoba, scrap.....	38 @ 39	33 @ 36
Mangabeira, sheet.....	34 @ 39	35 @ 40
Guayule.....	45 @ 50	32 @ 33
Balata, sheet.....	54 @ 55	55 @ 56
Balata, block.....	43 @ 47	45 @ 47
AFRICAN.		
Lopori, ball, prime.....	53 @ 54	52 @ 53
Upper Congo, ball red.....	51 @ 53	50 @ 57
Massai, red.....	50 @ 52	51 @ 52½
Soudan Niggers.....	42 @ 44	44 @ 45
Cameron, ball.....	44 @ 44	44 @ 45
Benguela.....	31 @ 31	31 @ 32
Acra, fiale.....	23 @ 23½	24 @ 25
Rio Nunez Niggers.....	52½ @ 53	52½ @ 53
Konakry Niggers.....	51 @ 52	51 @ 52
EAST INDIAN.		
Assam.....	52 @ 58	42 @ 45
Pont.....	8 @ 9	64 @ 7
Gutta Siak.....	12½ @ 14	11½ @ 12
Borneo II.....	30 @ 30	24 @ 25
Gutta Percha.....	2.00 @ 2.50	2.00 @ 2.40

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows:

"The same easy conditions have prevailed in the money market during September as for several months previously, and the demand for paper has been good, both from banks in this city and elsewhere, the best rubber names being taken at 4@4½ per cent., and those not so well known 5@5½ per cent."

NEW YORK PRICES FOR AUGUST (NEW RUBBER).

	1915.	1914.	1913.
Upriver, fine.....	\$0.56 @ 0.59	\$0.75 @ 1.15	\$0.84 @ 0.94
Upriver, coarse.....	42 @ 44	43 @ 49	51 @ 53
Islands, fine.....	50 @ 52	60 @ 100	74 @ 81
Islands, coarse.....	27 @ 28	30 @ 60	29 @ 33
Cameta.....	29 @ 31	32 @ 61	38 @ 41

RUBBER STATISTICS FOR LONDON AND LIVERPOOL, AUGUST, 1915.

			Stocks.		
	Imports.	Deliveries.	1913.	1914.	1915.
London—					
Plantation.....	8,406	3,680	3,138	3,524	5,131
Other kinds.....	53	62	1,017	748	455
Total.....	4,119	3,742	4,155	4,272	5,586
Liverpool—					
Para.....	606	733	764	598	819
Other kinds.....	178	139	1,134	874	490
Total.....	784	872	1,898	1,472	1,309
Total London and Liverpool.....	4,903	4,614	6,053	5,744	6,895

Plantation Rubber from the Far East.

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to August 16, 1914 and 1915. Compiled by the Ceylon Chamber of Commerce.)

To—	1914.	1915.
Great Britain	9,867,203	14,710,294
United States	8,386,000	8,567,536
Belgium	9,946,290	215,919
Germany	1,037,415	.....
Australia	309,095	393,497
France	250,712	234,272
Japan	218,100	215,919
Russia	105,212	332,200
Straits Settlements	42,335	119,933
India	1,752	1,000
Canada .....	.....	30,140
Total	20,052,525	24,914,801

(Same period 1913, 13,754,468 pounds; same period 1912, 6,957,230.)
 The export figures of rubber given in the above table for 1914 include the amount re-exported. (These amount to 2,538,771 pounds.) To arrive at the total quantity of Ceylon rubber exported for that period deduct these imports from the total exports. The figures for 1915 are for Ceylon rubber only.

TOTAL EXPORTS FROM MALAYA.

(From January to date named. Reported by Darlow & Co., Singapore.
 These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	Singapore. June 30.	Malacca. July 31.	Penang. June 30.	Port Swet- tenham. August 1.	TOTAL.
Great Britain	16,880,281	4,834,058	11,308,531	16,536,627	49,549,497
Continents	2,978,194	.....	638,790	20,160	3,637,153
Japan	896,841	.....	.....	.....	896,841
Ceylon	115,066	.....	266,533	925,695	1,307,294
United States	13,544,993	.....	408,133	.....	13,953,126
Australia	242,326	.....	.....	.....	242,326
Total	34,367,101	4,834,058	12,621,996	17,472,482	69,295,637
Same period, 1914	18,511,130	2,932,923	10,407,734	17,444,479	49,296,259
Same period, 1913	11,421,866	.....	6,988,266	15,202,528	33,612,660
Same period, 1912	5,911,343	.....	3,966,968	9,998,195	19,876,506

SINGAPORE.

Guthrie & Co., Ltd., report (August 11, 1915):
 The record quantity of 296 tons catalogued for the auction held today met with a fairly steady demand, about 160 tons changing hands.

Fine pale crepe was again wanted, the top price of the sale viz.: \$133, being paid for one very fine lot. Fine ribbed smoked sheet sold up to \$130, a decline of \$2. Plain smoked sheet was unchanged for the week, all parcels offered being readily taken.

The lower grades, with the exception of dark crepe, marked declines of from \$1 to \$6.

The demand for scrap was better than for some time past, virgin and pressed marking substantial increases.

The following was the course of values:

	In Singapore Pul.,*	Sterling equivalent per pound in London.	Equivalent per pound in cents.
Sheet, fine ribbed smoked....	\$128@130	2/ 5 7/8 @ 2/ 6 1/4	60.56@61.32
Sheet, fair to good ribbed smoked	126@127	2/ 5 1/2 @ 2/ 5 5/8	59.80@60.05
Sheet, plain, smoked	119@127	2/ 4 @ 2/ 5 3/8	56.76@60.05
Sheet, unsmoked	112@120	2/ 2 1/2 @ 2/ 4 1/4	53.72@57.27
Crepe, good pale	130@133	2/ 6 1/4 @ 2/ 7	61.32@62.84
Crepe, good pale	123@129	2/ 4 7/8 @ 2/ 6 1/4	58.53@61.06
Crepe, fine brown	119@126	2/ 4 @ 2/ 5 1/2	56.76@59.80
Crepe, good brown	113@119	2/ 2 3/4 @ 2/ 4	54.22@56.76
Crepe, dark	99@117	2/ 1 1/2 @ 2/ 3 1/2	52.45@55.73
Crepe, bark	108@113	1/ 11 1/2 @ 2/ 3 1/2	47.64@54.22
Scrap, virgin	83@104	1/ 8 1/2 @ 1/ 9 1/4	41.40@50.42
Scrap, pressed	70@91	1/ 7 @ 1/ 10 1/4	34.10@48.85
Scrap, loose	80@94	1/ 7 1/2 @ 1/ 10 1/4	40.29@46.12

* Pul. = 133 1/2 pounds.

Quoted in S. S. dollars. 2/4 [56 cents].

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official cablegram received from the Colonial Secretary, Singapore, announces that the export of plantation rubber from the Straits Settlements during the month of August amounted to 2,295 tons, as compared with 2,324 tons in July and 1,325 tons in the corresponding month last year.

The following is a comparative table showing the export for three years:

	1913.	1914.	1915.
January	784	1,181	2,576
February	743	1,703	2,741
March	898	1,285	2,477
April	767	1,548	1,978
May	814	1,309	3,588
June	812	1,236	2,349
July	1,120	1,884	2,344
August	1,485	1,815	1,965
Total	7,248	11,415	20,228

These figures include transshipments of rubber from various places in the neighborhood of the Straits Settlements, such as Borneo, Java, Sumatra and the non-Federated Malay States, as well as rubber actually exported from the Colony, but do not include rubber exports from the Federated Malay States.

PLANTATION RUBBER EXPORTS FROM JAVA AND MADURA.

	June.	Nov. Month.	Ending June 30.
EXPORTS TO—	1914.	1915.	1915.
Holland	31,968	330	2,235
To order—Hevea	31,968	189,820	1,464,445
To order—Ceara	86,704	.....	384,608
Castilloa	6,900	1,560	11,608
Castilloa	5,227	.....	5,227
Total	474,576	191,910	1,999,252
Great Britain	1,684	499	38,203
Hevea	377,676	371,342	1,730,848
Ceara	1,527	1,974	26,774
Castilloa	2,440	2,860	19,520
Total	380,327	382,795	1,815,345
Belgium .....	.....	.....	462
Hevea	83,624	.....	406,520
Total	83,624	.....	406,982
United States	20,854	57,246	3,160,766
Ceara .....	.....	.....	8,692
Total	20,854	57,246	3,169,058
Germany	25,166	.....	60,380
Castilloa .....	.....	.....	2,735
Total	25,166	.....	63,115
Singapore .....	.....	6,037	9,200
Hevea	20,922	76,217	114,138
Ceara .....	.....	.....	260
Total	20,922	82,254	114,726
Japan .....	.....	3,300	194,762
Australia .....	.....	14,601	86,605
Other Countries .....	.....	433	433
Grand total	1,011,469	1,247,095	4,488,259

THE RUBBER PRODUCTION OF PERU.

The following statistics of the rubber production of Peru and the rubber exported from that country to the United States in 1913, via Iquitos, Mollendo and Callao, have been compiled by the United States Rubber Export Co., Limited, of New York:

	Production.	Exports to the United States.
Cañcho	11,574	.....
Cañcho, white	33,284	3,159
Cañcho, sheet	31,557	.....
Gum, fine	1,125	.....
Gum, sapote	273	273
Peruvian, weak	571,395	71,357
Peruvian, medium	22,306	849
Peruvian, fine	1,546,288	114,895
Peruvian tails	783,457	.....
Cañcho, ball	2,635,026	682,825
Peruvian, coarse	485,445	27,771
Total	6,121,731	851,129

The same company's estimate of the world's consumption of crude rubber is given below:

WORLD'S CONSUMPTION OF CRUDE RUBBER, 1913.

Boaz	647
Canada	1,780
Japan	2,000
Denmark, Sweden and Norway	2,500
Italy	3,407
Belgium	3,686
Austria-Hungary	6,500
France	9,700
Russia	10,293
United Kingdom	17,880
Germany	18,832
United States	47,500
Switzerland	1,514
Total	126,259

IMPORTS FROM PARA AT NEW YORK.

[The Figures Indicate Weights in Pounds.]

AUGUST 16.—By the steamer *Gregory*, from Manaos:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Meyer & Brown.....	46,600	10,400	10,200	20,600	87,800
Arnold & Zeiss.....	114,500	11,900	25,700	114,700	264,800
Henderson & Korn.....	117,500	4,300	25,500	10,700	158,000
General Rubber Co.....	44,500	6,200	3,800	.....	54,500
Robinson & Co.....	45,700	.....	.....	.....	45,700
H. A. Astlett & Co.....	22,200	8,400	.....	.....	30,600
Total.....	391,000	41,200	60,200	146,000	638,400

AUGUST 16.—By the steamer *Gregory* from Iquitos:

	Fine.	Medium.	Coarse.	Caucho.	Total.
G. Amminck & Co.....	.....	.....	700	207,300	208,000
Chartered Bank of Spanish America.....	.....	.....	.....	119,100	119,100
H. C. Kupper.....	1,100	.....	2,000	14,100	17,200
A. R. Grace & Co.....	6,600	800	2,000	7,500	16,900
H. A. Astlett & Co.....	.....	.....	800	8,800	8,600
Toledano Exporting Co.....	1,100	.....	800	1,800	3,700
Total.....	8,800	800	5,800	358,100	373,500

AUGUST 30.—By the steamer *Denis* from Pará and Manaos:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Meyer & Brown.....	114,700	13,000	83,000	46,400	257,100
Arnold & Zeiss.....	136,300	8,100	87,600	201,900	434,900
Robinson & Co.....	123,500	.....	50,510	175,100	349,100
Henderson & Korn.....	54,500	13,600	19,800	28,800	117,700
General Rubber Co.....	68,100	6,600	8,000	1,000	83,700
W. R. Grace & Co.....	15,000	.....	.....	35,700	50,700
Hagemeyer & Brunn.....	10,400	1,100	21,800	.....	33,300
J. T. Johnstone & Co.....	10,000	1,800	11,900	.....	23,700

PARA RUBBER VIA EUROPE.

	Pounds.
AUGUST 30.—By the <i>Advances</i> —Colon:	
W. R. Grace & Co. (Coarse).....	13,500
Neuss, Hesselin & Co. (Fine).....	3,500
SEPTEMBER 1.—By the <i>Hyatia</i> —Montevideo:	
A. D. Straus & Co. (Fine).....	25,000
A. R. Straus & Co. (Coarse).....	3,000
G. Amminck & Co. (Fine).....	4,000
G. Amminck & Co. (Coarse).....	1,000
SEPTEMBER 3.—By the <i>Panama</i> —Colon:	
G. Amminck & Co. (Fine).....	4,900
W. R. Grace & Co. (Fine).....	1,200
SEPTEMBER 7.—By the <i>Mayan</i> —Montevideo:	
Valejas, Lobo & Co. (Fine).....	10,000
Valejas, Lobo & Co. (Coarse).....	3,500
SEPTEMBER 7.—By the <i>Pastores</i> —Cristobal:	
G. Amminck & Co. (Fine).....	25,000
G. Amminck & Co. (Coarse).....	2,500
SEPTEMBER 13.—By the <i>Hostilias</i> —Montevideo:	
G. Amminck & Co. (Fine).....	700
G. Amminck & Co. (Coarse).....	1,000

CENTRALS.

*This sign, in connection with imports of Centrals, denotes Guayaquil rubber.]	
AUGUST 23.—By the <i>Tenadores</i> —Port Limon:	
A. A. Linde & Co.....	200
Isaac Brandon & Bros.....	1,500
Suzarte & Whitney.....	800
AUGUST 23.—By the <i>Antilles</i> —New Orleans:	
E. Steiger & Co.....	6,000
AUGUST 27.—By the <i>Santa Maria</i> —Columbia:	
G. Amminck & Co.....	1,000
Maitland Coppel & Co.....	1,000
Pottberg, Ebeling & Co.....	500
AUGUST 30.—By the <i>Advances</i> —Colon:	
G. Amminck & Co.....	23,500
Lawrence Johnson & Co.....	9,600
Neuss, Hesselin & Co.....	2,000
W. R. Grace & Co.....	1,200
Paulo, Calvet & Co.....	1,200
Dumarest Bros.....	1,300
Andean Trading Co.....	5,600
American Trading Co.....	800
Gontard & Co.....	2,600
Mecke & Co.....	600
AUGUST 30.—By the <i>Marro Castles</i> —Mexico:	
Lawrence Johnson & Co.....	3,000
General Export & Commission Co.....	1,500
H. Marquardt & Co.....	10,000
Diez & Co.....	5,600
P. Frenkel.....	1,000
AUGUST 30.—By the <i>Monius</i> —New Orleans:	
E. Steiger & Co.....	12,000
SEPTEMBER 1.—By the <i>Sao Paulo</i> —Bahia:	
Adolph Hirsch & Co.....	16,000
Lawrence Johnson & Co.....	28,000
J. H. Rossbach & Bros.....	2,500
Various.....	8,000

	Fine.	Medium.	Coarse.	Caucho.	Total.
H. A. Astlett & Co.....	11,600	6,600	2,600	.....	20,800
G. Amminck & Co.....	11,200	1,200	7,500	.....	19,900
Cowdry & Co.....	10,000	.....	4,000	.....	14,000
Aldens' Successors, Ltd.....	.....	.....	2,500	3,000	5,500
Total.....	565,200	52,000	246,600	182,800	1,046,600

SEPTEMBER 1.—By the steamer *Sao Paulo* from Pará:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Meyer & Brown.....	45,500	4,700	15,500	33,500	99,200
H. A. Astlett & Co.....	4,100	17,200	58,400	75,200	154,900
Henderson & Korn.....	35,700	.....	4,000	17,300	57,000
General Rubber Co.....	36,700	4,500	15,600	4,000	60,200
Robinson & Co.....	16,700	1,100	33,000	.....	44,800
Arnold & Zeiss.....	13,100	2,000	7,700	.....	22,800
Rumsey & Greutert Co., Inc.....	9,300	2,500	1,900	19,500	33,200
W. R. Grace & Co.....	14,000	.....	900	400	15,300
G. Amminck & Co.....	5,600	.....	200	300	6,100
Total.....	174,700	32,000	189,200	151,200	547,100

SEPTEMBER 22.—By the steamer *Stephen* from Pará and Manaos:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Meyer & Brown.....	123,100	40,500	115,600	60,600	439,800
Arnold & Zeiss.....	337,900	20,700	62,900	105,600	527,100
Henderson & Korn.....	145,700	26,300	92,600	13,600	278,100
Hagemeyer & Brunn.....	170,100	17,200	21,400	.....	208,700
H. A. Astlett & Co.....	154,300	.....	37,700	9,500	202,300
Robinson & Co.....	166,400	7,000	29,300	22,700	165,400
Robinson & Co.....	110,100	7,000	.....	8,800	119,900
J. T. Johnstone & Co.....	20,000	1,100	21,100	.....	43,500
W. R. Grace & Co.....	.....	.....	26,400	.....	26,400
Muller, Schall & Co.....	22,000	.....	.....	.....	22,000
Muller, Schall & Co.....	8,400	.....	2,800	4,500	15,700
Total.....	1,288,000	114,800	459,900	226,600	2,089,300

	Pounds.
SEPTEMBER 16.—By the <i>Monius</i> —New Orleans:	
E. Steiger & Co.....	6,000
SEPTEMBER 18.—By the <i>Esperanza</i> —Mexico:	
H. Marquardt & Co.....	1,000
SEPTEMBER 19.—By the <i>Comas</i> —New Orleans:	
E. Steiger & Co.....	21,000
SEPTEMBER 20.—By the <i>Siraola</i> —Puerto Cortez:	
A. Rosenthal & Sons.....	5,000
Eggers & Heinlein.....	300
G. Amminck & Co.....	200
SEPTEMBER 20.—By the <i>Tenadores</i> —Port Limon:	
Muller, Schall & Co.....	1,000
A. A. Linde & Co.....	600
Isaac Brandon & Bros.....	400

AFRICANS.

	Pounds.
SEPTEMBER 3.—By the <i>Rome</i> —Lisbon:	
S. R. Sequerra.....	80,000
SEPTEMBER 4.—By the <i>Saxonia</i> —Liverpool:	
Meyer & Brown.....	11,200
SEPTEMBER 7.—By the <i>Rochambeau</i> —Bordeaux:	
Various.....	40,000
SEPTEMBER 9.—By the <i>New York</i> —Liverpool:	
Arnold & Zeiss.....	97,000
General Rubber Co.....	15,000
SEPTEMBER 10.—By the <i>Lapland</i> —Liverpool:	
Aldens' Successors, Ltd.....	67,000
Various.....	4,200
SEPTEMBER 16.—By the <i>Den of Ogi</i> —Liverpool:	
Robert Badenhop.....	11,200
SEPTEMBER 17.—By the <i>Baltic</i> —Liverpool:	
Rubber & Guayule Agency, Inc.....	11,200
General Rubber Co.....	30,000
Aldens' Successors, Ltd.....	102,000
Various.....	23,000
SEPTEMBER 20.—By the <i>Orduna</i> —Liverpool:	
Rubber Trading Co.....	11,200
SEPTEMBER 22.—By the <i>Monius</i> —New Orleans:	
S. R. Sequerra.....	25,500
Various.....	4,500

[*Denotes plantation rubber.]

	Pounds.
AUGUST 26.—By the <i>Launceston</i> —London:	
Firestone Tire & Rubber Co.....	767,000
Charles T. Wilson Co., Inc.....	235,000
AUGUST 26.—By the <i>Newcom</i> —Amsterdam—Rotterdam:	
Rubber Trading Co.....	30,000
AUGUST 27.—By the <i>Clough</i> —London:	
Meyer & Brown.....	56,000
The B. F. Goodrich Co.....	400,000
General Rubber Co.....	200,000
Robinson & Co.....	100,000
W. H. Stiles.....	11,200
J. T. Johnstone & Co.....	5,600
AUGUST 27.—By the <i>Philadelphian</i> —London:	
General Rubber Co.....	355,000
Goodrich Tire & Rubber Co.....	75,000
Aldens' Successors, Ltd.....	23,000

August 30.—By the *Glenstone*—London

The B. F. Goodrich Co.	\$50,000
Rumsey & Greutter Co., Inc.	75,000
Robinson & Co.	7,000
Aldens' Successors, Ltd.	2,200
Hadden & Co.	6,000
Rubber Trading Co., Inc.	94,000
L. Littlejohn & Co.	2,200
W. R. Grace & Co.	2,200
Edward Maurer Co., Inc.	18,000
Various	14,000
Total	\$736,400

August 30.—By the *London*—Batavia:

Meyer & Brown	\$145,000
Edward Maurer Co., Inc.	230,000
G. Amisack & Co.	12,500
General Rubber Co.	10,000
Aldens' Successors, Ltd.	330,000
Manhattan Rubber Mfg. Co.	11,200
Rubber Trading Co.	111,000
Robinson & Co.	10,000
Goodyear Tire & Rubber Co.	290,000
L. Littlejohn & Co.	192,500
Various	156,500
Total	\$1,213,700

September 3.—By the *Argentine*—London

Goodyear Tire & Rubber Co.	\$80,000
Edward Maurer Co., Inc.	75,600

September 3.—By the *Manhattan*—London

Meyer & Brown	\$56,000
Edward Maurer Co., Inc.	10,000
W. H. Stiles	11,200
General Rubber Co.	35,000
Charles T. Wilson Co., Inc.	70,000
L. Littlejohn & Co.	66,500
Total	\$387,800

September 7.—By the *Merton Hall*—Colombo:

Meyer & Brown	\$25,100
L. Littlejohn & Co.	51,870
W. H. Stiles	30,000
Arnold & Zeiss	45,000
Robinson & Co.	6,000
Edward Maurer Co., Inc.	36,000
Various	25,140
Total	\$237,100

September 7.—By the *Hollin Hall*—Singapore:

Arnold & Zeiss	\$30,000
Henderson & Korn	170,000
Edward Maurer Co., Inc.	725,000
Aldens' Successors, Ltd.	38,000
Goodyear Tire & Rubber Co.	185,000
The B. F. Goodrich Co.	112,000
J. T. Johnstone & Co.	50,000
F. Stern & Co.	50,000
L. Littlejohn & Co.	187,402
General Rubber Co.	15,000
Charles T. Wilson Co., Inc.	42,000
Hood Rubber Co.	22,500
Robert Baderhop	165,000
W. R. Grace & Co.	2,200
Various	12,098
Total	\$1,078,200

September 7.—By the *St. Kevins*—London

The B. F. Goodrich Co.	\$500,000
J. T. Johnstone & Co.	65,000
L. Littlejohn & Co.	57,000
Robinson & Co.	9,500
Aldens' Successors, Ltd.	11,200
Melchior Tire Co.	11,200
Total	\$653,900

SEPTEMBER 10.—By the *Sandland*—London:

Goodyear Tire & Rubber Co.	\$33,500
L. Littlejohn & Co.	50,000
Various	11,640
Total	\$48,500

SEPTEMBER 11.—By the *London*—Batavia:

Meyer & Brown	\$40,000
L. Littlejohn & Co.	112,500
Arnold & Zeiss	50,000
Robinson & Co.	10,000
Edward Maurer Co., Inc.	22,500
J. T. Johnstone & Co.	35,000
W. R. Grace & Co.	11,200
W. H. Stiles	7,000
Rubber Trading Co.	14,000
Various	148,500
Total	\$479,700

SEPTEMBER 11.—By the *London*—London:

Meyer & Brown	\$70,000
The B. F. Goodrich Co.	\$50,000
General Rubber Co.	190,000
L. Littlejohn & Co.	50,000
Robinson & Co.	18,000
Rumsey & Greutter Co., Inc.	16,000
W. H. Stiles	11,200
Various	5,000
Total	\$330,200

SEPTEMBER 16.—By the *Measur*—London:

Meyer & Brown	\$36,000
Rumsey & Greutter Co., Inc.	5,000
General Rubber Co.	190,000
Edward Maurer Co., Inc.	35,000
L. Littlejohn & Co.	47,540
W. H. Stiles	18,000
Total	\$331,540

SEPTEMBER 17.—By the *St. Ronald*—Singapore:

Charles T. Wilson Co., Inc.	\$70,000
W. R. Grace & Co.	35,000
Robert Baderhop	100,000
J. T. Johnstone & Co.	13,500
Aldens' Successors, Ltd.	103,000
The B. F. Goodrich Co.	100,000
Rousted & Co.	15,000
Henderson & Korn	235,000
L. Littlejohn & Co.	386,230
Edward Maurer Co., Inc.	45,000
Goodyear Tire & Rubber Co.	250,000
Arnold & Zeiss	1,142,739
Total	\$3,500

SEPTEMBER 17.—By the *Baltic*—Liverpool:

Arnold & Zeiss	\$8,500
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SEPTEMBER 18.—By the *Indragama*—Singapore:

The B. F. Goodrich Co.	\$415,000
Goodyear Tire & Rubber Co.	250,000
Henderson & Korn	345,000
L. Littlejohn & Co.	194,964
Robert Baderhop	50,000
J. T. Johnstone & Co.	90,000
Charles T. Wilson Co., Inc.	67,000
W. R. Grace & Co.	22,500
Arnold & Zeiss	10,000
Edward Maurer & Co., Inc.	20,000
Aldens' Successors, Ltd.	45,000
Hood Rubber Co.	20,000
Rubber Trading Co.	44,000
Fred Stern & Co.	6,000
Cox & Herbert	2,200
Total	\$1,519,164

SEPTEMBER 20.—By the *Orduna*—Liverpool:

Henderson & Korn	\$6,000
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SEPTEMBER 20.—By the *Kanara*—Colombo:

Meyer & Brown	\$50,000
General Rubber Co.	70,000
L. Littlejohn & Co.	118,180
Arnold & Zeiss	50,000
Various	56,000
Total	\$435,000

SEPTEMBER 21.—By the *Winnahula*—London:

Meyer & Brown	\$75,000
Goodyear Tire & Rubber Co.	50,000
General Rubber Co.	15,000
Aldens' Successors, Ltd.	80,000
Charles T. Wilson Co., Inc.	90,000
Robert Baderhop	7,000
Raw Products Co.	7,000
W. H. Stiles	3,500
Total	\$454,000

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK—JULY, 1915.

Imports	Quantity	Value
Rubber	9,758	\$47,501
Rubber scrap	199,821	29,240

Imports:

Rubber	31,454	\$188,750
Gutta percha	134,698	15,278
India rubber	16,286,888	8,140,861
Scrap rubber	249,797	25,994

PORT OF NEW YORK—AUGUST, 1915.

Rubber	16,984,853	\$8,300,926
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PORT OF BOSTON—AUGUST, 1915.

Imports:

India rubber	19,338	\$72,750
Gutta Jelutong (Pontanaka)	392,666	17,387
Various	411,994	\$25,176

Exports:

Rubber scrap	8,302	\$1,097
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PORT OF CHICAGO—AUGUST, 1915.

Imports:

India rubber	78,043	\$4,126
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PORT OF CLEVELAND—AUGUST, 1915.

Imports:

Rubber scrap	240	\$12
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PORT OF DETROIT—AUGUST, 1915.

Imports:

Rubber scrap	33,098	\$1,582
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PORT OF NEW ORLEANS—AUGUST, 1915.

Imports:

India rubber	66,884	\$69,985
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PORT OF NEWARK—AUGUST, 1915.

Imports:

Rubber scrap	90,800	\$590
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EXPORTS:

India rubber	157,459	\$88,056
Gutta percha	34,256	3,148
Rubber scrap	19,603	1,087

PORT OF PHILADELPHIA—AUGUST, 1915.

Imports:

Rubber scrap	1,088	\$43
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PORT OF PORT HURON—AUGUST, 1915.

Imports:

Rubber scrap	31,098	\$4,360
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PORT OF SAN FRANCISCO—AUGUST, 1915.

Imports:

India rubber	142,221	\$68,385
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EXPORTS OF INDIA RUBBER FROM MANAOS DURING JULY, 1915.

EXPORTERS.	FINE.	NEW YORK.				EUROPE.				TOTAL.	GRAND TOTAL.
		Medium.	Coarse.	Cancho.	FOCAL.	Fine.	Medium.	Coarse.	Cancho.		
Suter & Co.	67,189	6,672	17,640	84,849	176,430	16,766	2,980	6,856	5,250	54,096	230,526
General Rubber of Brazil.	62,662	14,143	31,392	28,817	127,206	94,846	18,948	6,656	190	113,630	240,836
Pralow & Co.	108,070	3,966	1,886	7,887	111,099	46,144	6,012	3,441	9,981	65,578	207,087
Tancredi, Porto & Co.	21,230	4,267	1,610	154	27,361	11,669	1,669	5,888	5,548	21,881	99,142
Stearns & Sons						9,157	699	1,758	17,779	29,394	29,394
Adolph H. Alden, Ltd.						13,686	2,153	5,401	47	20,660	20,660
Maxim Holman						5,394	1,021	14	13,362	6,349	8,724
G. Fredder & Co.		1,411	929	266	2,606	8,597				8,577	8,577
H. Bolding					4,685	5,000	80	430		5,000	5,000
J. G. Vignier	3,319	174	996		5,485		100	960	140	1,350	1,350
A. Sore & Co.						280		280		560	560
Theodore Levy, Camille Co.											
Messing & Co.											
Grand Totals	962,420	96,614	65,119	17,084	479,899	714,666	12,788	18,439	52,629	388,366	867,648
	17,718	377	2,896	17,706	178,209	14,784	518	1,098	87,308	104,708	285,252
	280,188	26,904	68,014	79,115	637,306	590,330	44,300	19,447	139,937	493,074	1,150,381

EXPORTS OF INDIA RUBBER FROM MANAOS DURING AUGUST, 1915.

EXPORTERS.	FINE.	NEW YORK.				EUROPE.				TOTAL.	GRAND TOTAL.
		Medium.	Coarse.	Cancho.	TOTAL.	Fine.	Medium.	Coarse.	Cancho.		
Suter & Co.	53,163	8,801	8,145	13,476	77,573	10,400	6,880	564	129	10,400	87,973
General Rubber Co. of Brazil.	20,690	3,900	1,838	13,755	40,183	170	3,581	4,674	3,115	39,727	79,744
Pralow & Co.	19,654	9,966	6,406	8,896	139,926	39,487	1,037	1,563	1,050	16,450	21,375
Tancredi, Porto & Co.	2,744	2,019	16		4,925	1,037	1,037	1,406	234	16,106	16,106
Stearns & Sons						15,993	1,406			17,399	17,399
Moraes, Carneiro & Co.	4,827		1,024	195	6,046						6,046
Total	166,078	18,707	26,971	66,116	241,864	100,006	13,436	7,439	4,674	124,555	399,027

THE RUBBER SCRAP MARKET.

THE first two weeks of September witnessed a rather colorless rubber scrap market that reflected the dullness of the crude rubber position. Business was quiet in all grades of scrap and the only interest in evidence was centered in boots and shoes. There was an acknowledged scarcity of stocks and the mills came into the market for small lots in order to try out the claim of short supplies. Sales of boots and shoes were reported at 7½ cents, and several large orders were reported at 7½ cents. The balance of the list exhibited little change worthy of record, and traders appeared to be waiting for the expected September buying movement.

During the last week of the month, the market developed a much stronger tone and boots and shoes advanced under good demand. Several lots were disposed of at 8½ cents and heavy buying was reported in one instance at 8 cents. Inquiries for trimmed arctics developed sales on a basis of 6½ to 6¾ cents. However, actual buying appeared to be limited to certain mills. No. 1 white auto tires sold for 6½ cents under a good demand, while No. 2 were quoted at 6½. Auto tires mixed were easy at 5½, and stripped and unguaranteed tires were quoted at 3½ cents. There was little interest shown in the other grades and prices remained practically the same as a month ago.

NEW YORK QUOTATIONS FOR CARLOAD LOTS.

September 29, 1915.

	Per Pound.
Boots and shoes	\$0.0775 @ 0.08
Trimmed arctics	.0615 @ .06½
White auto tires No. 1	.0675 @ .07
No. 2	.0675 @ .06½
Auto tires, mixed	.05 @ .05½
stripped, unguaranteed	.04 @ .04½
Solid tires	.04½ @ .04½
Inner tubes, No. 1	.24 @ .25
No. 2	.11½ @ .11½
red	.12 @ .12
Bicycle tires	.03 @ .03½
Irony tires	.01½ @ .01½
Auto peelings, No. 1	.08½ @ .09
No. 2	.06½ @ .07
White rubber, No. 1	.11 @ .12
No. 2	.09½ @ .09½
Red scrap, No. 1	.10 @ .10½
No. 2	.07½ @ .07½
Mixed black scrap	.02½ @ .02½
Rubber car springs	.03½ @ .03½
Horse shoe pads	.03 @ .03½
Mattings and packing	.00½ @ .00½
Garden hose	.00½ @ .00½
Air brake hose	.05 @ .05½
Cotton fire hose	.01¾ @ .02
Large hose	.01 @ .01½

MARKET FOR COTTON AND OTHER FABRICS.

RAW cotton has advanced steadily during the month and prices have reached record figures. The upward movement is supported by active trading that has not been equalled since the outbreak of the war. The South seems to be in a favorable situation for handling the crop and the outlook for the southern planter is bright. It is predicted that cotton will sell for 15 cents by the first of the year.

SEA ISLAND COTTON.

The demand was sufficient, early in the month, to keep the Savannah market unchanged. Mills were bidding from one-half to a cent under quotations. During the third week Sea Island advanced under a general and active demand, and by September 25 sales of Floridas and Georgias were being made in Savannah and interior points at the following figures: Fancy, 23 cents; Extra choice, 22½ cents.

EGYPTIAN COTTON.

The latest news from Egypt is of an encouraging nature as decided improvement in crop conditions is noted in many districts. The new level of higher prices has been maintained with firmness, despite the unfavorable trade reports and heavy stocks on hand. Late in the month the Alexandria markets followed

America's example by advancing. On September 23 the following prices were quoted: C. I. F. Boston, December shipment from Alexandria: Añ6, \$19.00 to \$22.25; Upper, \$16.13 to \$18.88; Nubari, \$19.88 to \$22.50; Sakelardis, \$20.63 to \$24.25.

FABRICS.

The cotton fabric market is advancing and prices are quoted with the understanding that new prices are being made every day.

The duck market is strong and heavy, buying orders are the cause of the rumor that mechanical ducks will be higher.

Tire fabrics are extremely active and a good volume of business is being done with the rubber mills.

The following are New York quotations on September 29, 1915:

Aeroplane and Balloon Fabrics:

Wamsutta, S. A. I. L. No. 1, 40-inch	yard	\$0.22
No. 4, 38½-inch		.22
O/X R, 36-inch		.10½

Wool Stockinettes—52-inch:

A—14-ounce	yard	1.12½
B—14-ounce		1.25
C—14-ounce		1.50

Cotton Stockinette—52-inch:

D—14-ounce	yards	.46
E—11½-ounce		.36
F—14-ounce		.50
G—8-ounce		.40
H—11-ounce		.45
I—9-ounce		.37½

Colors—white, black, blue, brown.

Tire Fabrics:

17½-ounce Sea Island, combed	square yard	.64
17½-ounce Egyptian, combed		.54
17½-ounce Egyptian, carded		.51
17½-ounce Peelers, carded		.40

Sheetings:

40-inch 2.35-yard	yard	.08½
40-inch 2.50-yard		.08
40-inch 2.70-yard		.07¾
40-inch 2.85-yard		.07
40-inch 3.15-yard		.06½

Quenaburgs:

40-inch 2.25-yard	yard	.09½
40-inch 2.48-yard		.08½
37½-inch 2.42-yard		.07

Mechanical Ducks:

Hose	yard	.23
Belted		.22½ @ .23

Carriage Cloth Duck:

38-inch 2.00-yard enameling duck	yard	.11
38-inch 1.74-yard		.12
72-inch 16.66-ounce		.25½
72-inch 17.21-ounce		.26½

Drills:

38-inch 2.00-yard	yard	.10¾
40-inch 2.47-yard		.08¾
52-inch 1.90-yard		.12¾
52-inch 1.95-yard		.11
60-inch 1.52-yard		.14

Yarns:

Garden Hose 12/2 cabled	yard	.24
Fire Hose 12/1		.22

Imported Woolen Fabrics Specially Prepared for Rubberizing—

Plain and Fancies:

63-inch, 3¼ to 7½ ounces per square yard	yard	\$0.38 @ 1.55
36-inch, 2¼ to 5 ounces per square yard		.35 @ .85

Plaid Linings:

63-inch, 2 to 4 ounces per square yard	yard	.35 @ .75
36-inch, 2 to 4 ounces per square yard		.20 @ .45

Domestic Worsted Fabrics:

36-inch, 4½ to 8 ounces per square yard	yard	.20 @ .30
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Burlaps:

3½—7½-ounce	100 yards	\$5.15
40—7½-ounce		5.50
40—8-ounce		5.60
40 10-ounce		7.60
40—10½-ounce		7.75
45 7½-ounce		6.40
45 8-ounce		6.50
48 10-ounce		10.25

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

SEPTEMBER has been an extremely quiet month for the rubber chemical trade. Routine business has been normal and prices practically unchanged throughout the month. The rubber mills are apparently not inconvenienced to any great extent by the absence of German supplies.

The market for barytes has been quite steady and the scarcity of German grades has not affected the market, but has helped the consuming demand for domestic goods. The prices for pure white and off-color barytes have undergone no change since last month.

The market for chalk remains uncertain and forward shipments are extremely difficult to predict. Despite the difficulties in securing raw materials, the producers of whitening have not advanced prices.

Spot supplies of both domestic and foreign lithopone are difficult to obtain and domestic manufacturers appear to be sold up on contracts. The prices on both foreign and domestic grades are nominal. Zinc oxide continues to be in steady demand due to the regular call for deliveries on contract. New contracts are reported to have been made at higher prices, but the present list shows no change over last month. Zinc sulphide has advanced to 7½ cents.

Crimson antimony is to be had in limited quantities at prices varying from 80 to 85 cents per pound, while limited supplies of golden are quoted at from 60 to 70 cents—both quotations being nominal. Black hypo is only to be obtained in small lots and several dealers have reported that there was none to be had at the present time.

The pig lead market developed a strong tone during the closing week of the month and predictions of higher prices were heard. White lead, red lead and sublimed blue lead, however, have not changed in price since last month, in spite of the upward tendency of the raw material.

Dry colors have been in good demand and prices are holding firm at the unusual levels established by war conditions. Domestic production is not yet far enough advanced to affect the market. Soluble aniline oil colors have advanced to \$2.50 per pound, showing an increase of 50 cents over last month.

The solvents have changed but little. The output of benzol is constantly increasing and notwithstanding the growing demand at home and abroad, the price is occasionally shaded from 85 cents to 80 cents a gallon.

PRICES OF CHEMICALS AND COMPOUNDING INGREDIENTS NEW YORK, SEPTEMBER 29, 1915.

Acetone (Gruims)	lb.	30.25	30.12
Acid, acetic, 28° Baumé (dist.)	lb.	3.00	3.12
glacial (carboys)	lb.	15	16
Aluminum Flake (carboys)	lb.	90.00	90.00
Ammonium carbonate	lb.	80	85
Verminox, crimson, sulphurated of (carboys)	lb.	60	70
golden, sulphurated of (carboys)	lb.	190.00	200.00
Asbestos	lb.	.04	.05
Asphaltum "60" Brilliant	lb.	.03	.04
Barium sulphate precipitated	lb.	16.00	20.00
Barytes, pure white	lb.	12.50	14.00
off color	lb.	105.00	110.00
Benzoin	lb.	85	90
Benzol, pure	lb.	.00	2.50
Beta Naphthol	lb.	.01	.02
Black Hypo	lb.	.00	.01
Blanc Fixe	lb.	.00	.01
Bone ash	lb.	.00	.01
black	lb.	.00	.01
Calcium tri-sulphide	lb.	.00	.01
red	lb.	.00	.01
Castella gum	lb.	7.00	8.00
Carbon, insoluble (drums)	lb.	.02	.03
terechloride (drums)	lb.	18	20
Caustic soda, 76° Baumé (bbis)	lb.	5.00	5.50
Chalk, precipitated, extra light	lb.	8.00	9.00
China clay, domestic	lb.	16.00	24.00
imported	lb.	60	10
Chrome, green	lb.	12	14
yellow	lb.	12	14

Crude rubber	lb.	1.00	1.00
natural	lb.	1.00	1.00
smoked	lb.	1.00	1.00
vulcanized	lb.	1.00	1.00
hard	lb.	1.00	1.00
soft	lb.	1.00	1.00
sheet	lb.	1.00	1.00
block	lb.	1.00	1.00
granulated	lb.	1.00	1.00
in bulk	lb.	1.00	1.00
in drums	lb.	1.00	1.00
in bags	lb.	1.00	1.00
in boxes	lb.	1.00	1.00
in kegs	lb.	1.00	1.00
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SPAIN AS A MARKET FOR AMERICAN RUBBER TIRES.

Spain can hardly boast the good roads that some other European countries have, nor is the general level of wealth in that country particularly high, but at the same time a good many automobiles are used there and the number is constantly increasing. And while hitherto the tires for these machines have been imported from neighboring countries, the present difficulty in the way of continuing these importations makes Spain rather an inviting field for the American manufacturer. The auto. tires hitherto principally used in Spain have been the Michelin and Le Gaultois, made in France, and the Prowodnik made in Russia. In addition, the Klein tire, manufactured in Spain, and the only tire of home manufacture, has been in considerable use. Some American tires, principally Goodrich, have also been sold. The preference for foreign tires is shown by the fact that the French, Russian and American tires have all commanded a price from 10 to 15 per cent. above that paid for the home-made brand.

There is no prejudice whatever in Spain against American tires, but it would be impossible for a manufacturer to get any foothold in that country unless he established an agency or branch office in Barcelona—which is the national center for the automobile trade—and then in addition had sub-agencies in several of the larger cities which could draw their supplies from the Barcelona store.

It would be necessary to have a selling force able to speak Spanish, or, at the least, French, a language with which the more pretentious business men are familiar. Then of course it would be necessary to do more or less pioneer work in order to make any headway against the brands already established in that country. The European tire makers resort to considerable general advertising, using the newspapers, bill-boards, theater curtains and the other means of reaching the public generally which are familiar to all large advertisers.

The tire size most generally used is 815 x 105 millimeters, corresponding closely to 32 x 4 inches. The Spanish tire, the Klein, retails in this size at \$26.40 for a plain casing, and \$7.40 for an inner tube. Other sizes sell at proportionate prices.

The Spanish customs duty on all pneumatic tires, including automobile tires, is 2.70 pesetas (52 cents) per kilogram of net weight (2.2046 pounds). On solid tires, including tires for horse-drawn vehicles, these duties are 1.20 pesetas (23 cents) per kilogram of net weight.

Carriage tires of rubber are also extensively used in Spain, especially for such types of vehicles as broughams, Victorias, landaus and dog-carts.

AEROPLANES ARE IN DEMAND ABROAD.

During June and July of the present year Great Britain imported from the United States aeroplanes valued at \$765,544. Italy imported aeroplanes worth \$10,105, and Mexico imported \$3,535 worth of flying machines during the same period.

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BUYERS' DIRECTORY
PAGE 73

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THE NEW EXPORT TAX ON CEYLON RUBBER.

THEORETICALLY, the English mind is strongly addicted to the doctrine of free trade—the import and export of material and merchandise without barrier or burden. But theories bend to conditions, and as the times are very much out of joint the Colonial authorities of Ceylon decided early in October to place an export tax of ten shillings per 100 pounds, or 2½ cents a pound, on all rubber leaving their ports. This action came as a distinct surprise to the rubber importing trade of the United States and its immediate effect was an advance in price of plantation rubber, followed by a lesser increase in the price of Brazilian sorts.

One cause assigned for this new levy was labor difficulties on the plantations arising from the recent riots in some of the Eastern cities; but probably the underlying reason was the financial pinch felt in British administrative circles, both at home and in the

colonies, in unison with all the other belligerents. This urgent need of revenue is likely to be a chronic condition among the warring nations, at least for some time to come, and as a consequence imposts that are placed on commerce now may be looked upon as there to stay for a considerable length of time.

But the most interesting question is, who will have to pay this extra 2½ cents per pound? The customer? If so, the importers, manufacturers or consumers, or all three combined, of the United States will have to bear at least one-half the burden. The rubber exports from Ceylon for the first eight months of the present year, omitting re-exports of rubber produced elsewhere, amounted to over 25,000,000 pounds. Nearly 40 per cent. of this was shipped direct to New York. Undoubtedly another 15 per cent., which went to London, later found its way to American ports. It will be safe to estimate the total exports for the year at 40,000,000 pounds, over 50 per cent. of it coming, first or last, to the United States. So that if the customer pays the tax, our contribution for the year would amount to over half a million.

But in the present condition of the market, with the abundant supply of rubber, the customer is not likely to bear very much of this burden. In fact, he appears already to have shifted it back upon the producer. For though the price of plantation rubber advanced 1½ cents a pound on the announcement of the tax, in less than three weeks' time this entire advance had disappeared and Ceylon rubber was being offered at the same figures as before the imposition of the tax.

There is no assurance, however, that the consumer may not feel the effect of this tax later. The exigencies of the war will call for more and more revenues, and it is quite within the possibilities that this initial tax of 2½ cents per pound may be materially added to, as necessity arises, and that other Eastern ports may also get the habit. It is quite conceivable under present conditions, and with no prospect of immediate peace, that Eastern rubber might ultimately be called upon to pay export duties equal to those of South America, for instance, where Manaois levies 18 per cent. and Para over 22 per cent. In that event, the producer could hardly be expected to bear the burden alone. His offerings would certainly decrease, prices would advance, and the consumer would either have to shoulder some share of the burden or else be content with decidedly smaller supplies. Of these two alternatives he would undoubtedly accept the former.

WILL THERE BE A "DUMPING" OF RUBBER GOODS?

MANY reports have come from Washington of late to the effect that our statesmen, now scattered abroad over the country but soon to re-convene at the national capitol, are considering the possible effects upon the American market of the cessation of hostilities across the waters. A considerable number take the attitude that Europe will be in such dire straits, and it will be so necessary for her to rehabilitate herself industrially that she will be willing to forego all profits and all luxuries, and even the comforts of life, in order to reopen her factories and find purchasers for their products. As a consequence, they fear a great dumping of cheap European goods on the American market.

Others take an opposite view and maintain that when the war is over Europeans will be so exhausted in men, morale and material that they will be totally unable to compete with the healthy economic conditions which obtain in this country, and that American manufacturers will have nothing to fear from European products.

Probably both of these extremes are wrong. Undoubtedly the truth lies in some middle ground. There is no question that Europe will be in a very sad state industrially and that she will bend every energy towards re-entrance into her former markets; but that these efforts will be sufficient to flood the United States with extremely low-priced products seems hardly probable. It is likely, however, that in a short time after the conclusion of hostilities, American imports of European goods will equal, if they do not surpass their volume prior to the outbreak of the war.

How will this situation affect the rubber trade? In footwear and mechanical goods probably very little. In the tire trade and in hard rubber, druggists' sundries, clothing, sporting goods and toys the effect is likely to be more noticeable. For instance, after the enactment of the Underwood tariff, which reduced the duties on tires from 35 to 10 per cent., there was a noticeable increase in the imports of this article. During the first seven months of 1913 manufactured rubber imports into the United States equaled in value \$720,544. During the first seven months of the following year, after the new tariff had gone into force, these imports increased nearly 50 per cent., and, undoubtedly, had it not been for the war, imports of tires and the other kinds of rubber goods mentioned above would have continued to show a substantial growth in volume.

Accordingly, in view of the situation immediately antedating the European outbreak, it seems altogether reasonable to anticipate that when peace is restored there will be an increase in imports of rubber goods, which, while not necessarily alarming, will at least be worthy of attention on the part of American manufacturers.

THE GROWING RANKS OF RUBBER IMPORTERS.

IT was not so many years ago that a man with the normal number of digits could count the American importers of crude rubber on the fingers of one hand—with possibly some slight assistance from the other hand. Of brokers, pure and simple, there were still fewer. But all that has been changed. A fairly careful listing of the companies, firms and individuals now engaged in the pursuit of importing crude rubber into the United States shows their number to be 115, while of brokers there are 23; making a substantial total of 138. This growth in the number of the importers' ranks is certainly a noteworthy feature of the general development of the industry.

To be sure, the manufacture of rubber goods in the United States is vastly greater now than it was a few years ago and the importation of crude material naturally is much larger. By way of comparison, 20 years ago the entire value of the annual production of rubber goods in this country did not exceed \$75,000,000, and the annual consumption of crude rubber was not over 18,000 tons. The year 1915 will unquestionably witness a production of rubber goods exceeding \$400,000,000 in value, or over five times its value of two decades ago; while crude rubber imports will be close to 60,000 tons if they do not exceed that figure. But even so, with all this great general growth, the increase in the number of importers and brokers has been proportionately much more rapid and presents an interesting phenomenon.

AN OVERSEAS TRUST TO INSURE NEUTRALITY.

THE American Overseas Corporation, which bids fair to be in operation within a very few days, seems on the surface to be an excellent idea—so excellent, in fact, that it is surprising that it has not been suggested before; as it is a simple arrangement for avoiding the delay and irritation of the constant surveillance of American cargoes by the belligerent powers.

Briefly, the plan is to form an organization of large exporting and financial interests to guarantee that American exports shipped to neutral countries are in reality designed for neutral consumption. While the United States Government will not be officially responsible for the conduct of the enterprise it has, through Secretary Redfield, given its approval of the project and agreed to render it substantial assistance.

It is stated that the British Government is ready to give recognition and approval to this new movement. This is quite logical, as it would relieve the British authorities of a great deal of irksome police duty. Instead of being obliged to keep constant oversight over a large number of exporters, great and small, it will be able to deal with one responsible organization whose standing will place its good faith beyond question. While to American commerce it means a welcome relief from irritating interference, with not infrequently costly delays.

The Story of Gutta Percha—IV.

SOURCES—CONTINUED

IN the whole world there is no other article about which there is so much of lying, thieving and fraud as crude gutta percha. Cheating each other, cheating the ultimate consumer, is the chief vocation, the production of real gutta percha being quite incidental. As it arrives it is worthless for manufacture, and it is only after a prolonged series of cleansings that the free gifts of the simple forest people have been eliminated and the gum rendered fit for use.

The gatherer does not consider that he is cheating when he puts stones into the product he sells to the dealer, who cheats him in price and weight. It is only a trade custom. The Chinaman also has his trade customs and an amazing knowledge of the chemistry, physics and economics of adulteration and cheating. As the supply grows less, the mixture of water, dirt and inferior gums grows larger. There is a

great variety of sorts of gutta percha in the eastern markets, all known by Chinese or native names and differing from each other chiefly in the manner of their adulterations. Dr. Sherman took a specimen of the pure gum to a Chinese dealer and asked him what kind it was. The latter said that it was a new kind to him and that he guessed no Chinaman had made it—which was a good

guess. These traders pay the native gatherers of the more remote districts about three cents a pound for their product, giving in payment "traders' goods" of quite as honest quality as the gutta percha which comes from their adulteration studios. The problem of their regulation or suppression is one which imperatively confronts all the governments having lands with gutta percha forests.

EXPLORING FOR GUTTA

The first supplies of gutta percha naturally came from the Malay Peninsula, but with the increasing demand, Sumatra, just across the strait, soon began sending its gum. Further and further away the traders reached. In a few years all the great trees in readily accessible districts had been hacked down and supplies were coming from far afield. As the young trees grew to maturity, they fell under the axe and, for all practical purposes, the gutta percha tree ceased to exist in the localities where it was earlier known. From further and further away the supplies came, for, as the gatherers were forced to go further into the interior, the natives

of the outer periphery were roused to begin the destruction of the trees of their own forests. So the stream steadily flowed into and from the shipping ports and fatuity declared that this was sure proof that the forests were inexhaustible and the supply would always keep pace with the demand. Borneo was soon drawn upon—the last of the great reservoirs was tapped. But in the early eighties the insistence of men who declared that destruction without renewal could not forever go on aroused the French, British and Dutch governments to try to learn something about this mysterious reservoir of gutta percha, from which for forty years the world's supply had been ceaselessly drawn.

France was first in the field in the person of M. Seligmann-Lui, who, in 1881, was sent by his government to explore the gutta percha country for trees and then look for more of the same kind in the neighboring French possession of Cambodia

and French Cochinchina. This expedition proved that gutta percha trees cannot be had by wishing for them, and French Indo-China had to continue without native gutta percha forests. But M. Seligmann-Lui gained much valuable information about the habitat and characteristics of the gutta percha-producing trees.

The expedition of Mr. Leonard Wray, Jr., who thor-

oughly explored the Malay Peninsula, not only placed important botanical material in the possession of the establishment at Kew and in the Indies, but contained illuminating information as to the wasteful manner in which the collection was made and the amount of gum left to decay in the fallen tree.

The last of the historic expeditions was perhaps the most important of all—that of Dr. W. Burck, of the Dutch Colonial Service, who, at the time he started, late in 1883, did not know of the expeditions of M. Seligmann-Lui and Mr. Wray. He was a thorough botanist and his painstaking studies were embodied in a monograph on the *Sapotaceae* of the East Indies. He pointed out that the genus known as *Dichopsis*, having been separated from *Isonandra*, was identical with the genus described, as *Palauquium* by Father Blanco in his "Flora of the Philippines." His researches and conclusions have come to be regarded as the final word as to the botanical characteristics and distribution of the gutta percha trees.

In 1912, Herr Rudolph Schlechter, of the German colonial ser-



STARTING A GUTTA PERCHA PLANTATION, BUKIT TIMAH, SINGAPORE.

mitte, exploring the north coast of Kaiser Wilhelm Land—the German section of New Guinea—spent several days in travel through dense swamps, toward the Bismarck mountains. Near the Goldfields station they found gutta percha of good quality. They felled some large trees which Herr Schlechter identified as a species of *Palaquium*, the product being equal to, if not identical with, the product known to the Malays as "getah taban merak," and belonging to the best type of gutta percha. The material found had the same reddish tinge as that seen in Perak.

At the time of the American occupation of the Philippines, and for several years later, all works on gutta percha made the specific statement that no gutta percha-producing trees had been found in those islands. Yet, for twenty years, at least, exportations had been going on. The trade had almost stopped, however, because the gum had

been so debased by the Chinese adulterators that the usually none-too-particular post dealers had revolted, and would have no more of it. Immediately after the Americans assumed control, the gathering and export were resumed. In 1900 the government learned that the wild natives of Mindanao were engaged in cutting down the gutta percha trees at a rate which meant their speedy extermination. To get at the real facts they dispatched Dr. Pennoyer Sherman, Jr., who made a thorough exploration of the islands, reporting on the botanical and economic aspects of the matter. He found gutta percha-producing trees in large areas of Mindanao and a few in other localities, including some small tracts in Luzon. There were nine species of *Palaquium*, but none of *Palaquium gutta* or its sub-species. It was, indeed,

in the "Flora of the Philippines" that *Palaquium* was first named. The valuable *Payena Lerii* was also found, and furnishes a considerable part of the exports.

AT LAST, MODERN METHODS.

Although these expeditions did not

result in the discovery of new and untapped "inexhaustible" forests of gutta percha trees, they gave much-needed light on the methods necessary for the finding of future supplies of the indispensable gum. It was realized that there was a distinct anomaly in gaining a necessity for the greatest triumph of modern civilization by methods which it

were base flattery to describe as paleolithic. Nature had spent fifty years in building up a beautiful tree, which has the mysterious power of making the much-prized gutta percha. A naked savage cuts it down and leaves it to rot, draining out a pound of gutta percha, and leaving forty times as much to go to waste. He mixes a little dirt and water with the gum, sells it for a few cents to a dealer, who adds his own sophistications, and passes it along on its way to civilization. And for this destructive work the people who are most interested in preventing it pay ever higher and higher premiums!

There are evidently three

ways in which to meet the problem of conserving the supply. One is the protection of the remaining forest trees; another is better means of collecting, and a third, the cultivation of the plant. All three methods have been undertaken by the Dutch authorities of the East Indies, and probably in time to avert a real disaster in the failure of the supply. The first is the one which most naturally occurs to the student of the problem, but



GUTTA PERCHA NURSERY.



GUTTA PERCHA PLANTATION HEADQUARTERS, JAVA.

it is hedged about with great difficulties. The native of the back districts knows only the law of the jungle, which is not the same as that of the colonial office. Those who know how bitterly the pot-hunting classes of civilized lands resent the

enactment and enforcement of necessary game laws, may have some faint idea of what the native of the forest, a hundred miles from the nearest white station, thinks of a law which says that he shall not cut down the tree which no white man ever has seen or ever will see. The tree is there, the Chinese dealer is convenient, and he needs the money. Forest laws are highly desirable, but only the most impossible optimist will see in them any effective correction of existing conditions. Laws forbidding export will do something, but where there are thousands of miles of coast line, with innumerable coves sheltering the craft of a race of born sailors, it will be seen that this plan also presents difficulties.

In the matter of collection it is obvious that the industry of deliberate adulteration with either dirt or inferior gums is not one to be encouraged. The one sure way to suppress an undesirable commodity is to destroy its market; and it is a question whether the time has not arrived when importing countries should not take steps to abate the adulteration nuisance. If all gutta percha arriving at the ports of the consuming countries were subject to analysis and refused admittance, when too outrageously sophisticated, the dealers in dirt would begin to learn their trade over again. It cannot be left to individual buyers to reject the debased commodity. Competition will always defeat any plan of that kind. If undertaken by the governments, every effort should be made

to prevent any country from trying to gain an advantage in trade by offering an open market to the outlawed adulterations refused by other ports.

The economist must weep when he sees a great tree cut down

for a handful of gutta percha, and weep again when he sees three per cent. taken away and ninety-seven per cent. left to decay. The first consideration is whether the gum may not be secured by tapping, leaving an uninjured tree to produce further supplies. The answer is that it can be so obtained, but not by the irresponsible wild gatherer. The native does not know how to tap the trees, and does not

want to know. It is far easier and much less dangerous to fell the tree, and the yield is greater than that gained by tapping. If he undertook tapping with the tools he carries, he would kill the tree and get practically nothing for his pains.

Reform in this direction, while highly desirable, does not seem to promise much in regard to the remaining forest supplies. As in most if not all latex-producing plants, the characteristic product of the gutta percha trees is found in the leaves, as well as in the bark. As a matter of fact there is, weight for weight, about twice as much gutta percha in the leaves as in the bark, but obtaining it is not so simple a

matter. If a dried leaf of *Palaquium* be broken and the pieces carefully pulled apart, little white threads of gutta percha can be seen, and if a green leaf be broken, tiny beads of latex will appear like those on a dandelion or lettuce leaf. Early experiments, though carried on with a great deal of perseverance, failed to extract the gutta percha in satisfactory form, and a heap of gutta percha leaves was as a matter of practical



CULTIVATED GUTTA PERCHA TREES (4½ YEARS OLD) AT PANJINDANGAN.



CULTIVATED GUTTA PERCHA TREES AT TIJEPITR (*PALAQUIUM ORBICULIFOLIUM*; AGE 22½ YEARS).

value very much like a clay bank containing thousands of dollars' worth of aluminum, which it would cost tens of thousands to extract. Physical and chemical processes both were tried with varying success, the chief chemical processes being the dissolving out with various petroleum products or with toluene, or with other resinous distillates. By this means gutta percha of a high degree of commercial purity and low resin-content was obtained, but there were strong disputes as to its availability for each purpose. It was maintained by some chemists that, notwithstanding the low resin-content, these resins were more detrimental than the larger proportion found in the ordinary commercial gutta percha. In the leaf gutta percha the resin is chiefly alban, and it was claimed that a more nearly equal mixture of alban and fluavil, even in larger proportion to the amount of gutta, improved the dielectric and tensile properties. The earlier leaf gutta percha was also distinctly colored with chlorophyll, and "green gutta" was put down in the market as of distinctly inferior grade.

The mechanical production involves the comparatively simple process—on paper of grinding and boiling the leaves. As a matter of fact, it was only after prolonged study and effort that the mechanical details were perfected and commercial success attained. This, however, has been done, and a large part of the future supply of gutta percha will certainly be of leaf origin. It is not likely, however, that leaf production will ever figure largely in the case of wild forest trees. To carry the necessary machinery to the forests, or to carry the leaves to the settlements, would not be an easily economical process.

It is, then, to the cultivated *Palaquium* groves that we must look, and that involves a good look ahead, for the "taban merak" is a slow-growing tree, and if "the man who plants pears, plants for his heirs," the same is even more true of gutta percha. But we, who are the heirs of all the ages, have reason to be glad that others before us have looked out for us, and, while most of us are selfish and short-sighted, there are in every generation a few who are wise beyond their time. One of these was J. E. Teyssmann, who, in 1856, procured the planting of some trees of "taban merak" at the residency gardens at Buitenzorg, of which he was curator from 1830 to 1869. From the few trees then planted will come a far greater part of the world's future supply than from all the countless millions then standing in the "inexhaustible forests," which short-sighted persons were engaged in exploiting. These furnished the stock of the gardens planted at Tjipetir, in Java. From these gardens will come the stock of most of the future gutta percha plantations of the East Indies—that is to say, of the world.

The plantations are on the south coast of Java, and are situated at an elevation of 1,700 feet. The first planting was made under the supervision of Dr. Burck. There are now about 2,500 acres under planting. At the beginning the trees are planted four feet apart each way. After three years they have grown so that thinning must be resorted to, and the leaves and

young twigs are utilized for the production of gutta percha. From this time on, the proportion of gutta percha obtained grows greater, and from a mature plantation it is believed that there can be had about one hundred pounds to the acre. Of this, about three-fourths would be from the leaves, while one-fourth would be obtained by tapping by the herring-bone method. If the leaf-gutta lacks in any degree the qualities of that obtained by tapping, it is at least superior to most of that which comes to the market, while for purity and evenness of standard, that obtained by tapping in plantations is, of course, unequalled.

At prices paid in recent years for the best qualities a yield of at least \$150 an acre for a long series of years is one which could easily be anticipated.

Wireless telegraphy is invaluable in providing communication with ships at sea, and it is highly useful in supplementing cable communication. But, so far as the demand for gutta percha is concerned, it is likely to make for its increase rather than otherwise. For the wireless, being much less capable of monopolization than cable communication, tends to set a limit to the price which can be charged for messages. On the other hand, for long distances, the cable can be operated more cheaply. The wireless keeps down the rate. The cable company bids for business at lower rates. Lower rates mean more messages; greater facilities; more cables, more gutta percha.

Gutta percha species of various sorts have been planted here and there through the Malay peninsula. Experiments conducted by the forest department in 1913-14 consisted in cutting off some sixty gutta trees at a height of about 15 feet and plucking from 50 to 100 per cent. of their leaves. These trees had put out new shoots and grown

new leaves five months after their mutilation and their appearance was quite healthy, proving that the growing gutta tree can be relieved each year of all its leaves without fatal injury.

In tapping experiments one thousand and thirty trees having a minimum girth of 18 inches produced a total of 409 pounds of clean gutta, or an average of 6.35 ounces per tree. In no case were the trees excessively damaged, most of them being only slightly tapped. Some trees measuring from 30 to 42 inches in girth produced as high as 11 ounces each, while 17 trees exceeding 42 inches in girth produced $1\frac{1}{2}$ pounds.

The French Government also has planted with *Palaquium gutta*, *Payena Lerii*, and other gutta trees in Algeria, Madagascar, Martinique, Guadeloupe and French Guiana. The growth of these trees is exceedingly slow, and it is generally felt that private planters should not be expected to tie up their capital for so long a time, but that governments should do the planting.

The area that can be profitably planted with *Palaquium gutta* remains to be seen. Besides countries to which the tree is native there are—Java, where success has already been attained; probably the Celebes, the Philippines, the Moluccas and New Guinea; also Ceylon and the southern part of British India. Not improbably, also, certain localities in the corresponding latitudes of Africa and South America.

(To be continued)



A CHINESE MORO TRADING BOAT AT MINDANAO FOR GUTTA PERCHA.

Rubber in the Service of Life Saving.

MOST of us have heard so much about the ordinary cork-lined life-preserver that we have generally come to look upon this material as the best thing for the service. This is a mistake. There is no denying the virtues of this buoyant bark, but it has its drawbacks. A cork-packed life-belt is bulky, and because of this fact a number of them require a good deal of space. Therefore, in most instances, we find these protective articles stored away in more or less inaccessible places. To get them out of the way they are put just where panic-stricken passengers will find it hardest to get them when the moment of peril arrives. Because of these circumstances, inventive cunning has been busy for years in seeking other forms of life-preservers, turning to different materials to solve the problem of compactness and buoyancy, together with greater accessibility in time of need.

It is an interesting fact that the first and also the last work in which Charles Goodyear interested himself had to do with life-preservers. In the winter of 1834, after an unfortunate career in the hardware business, Goodyear, who was then a young man a trifle over 30 years of age, visited New York on a business errand and happened to pass the New York store of the Roxbury Rubber Co. He had read quite a little about the wonderful success of the new rubber industry which had recently sprung into existence, and he went into the store to examine some of the rubber products manufactured by that company. His attention was attracted to a life-preserver.

He examined it carefully and, with his quickness of perception he discovered that it was susceptible of considerable improvement. He went home and thought the matter over, and his ingenious mind soon suggested how the apparatus could be improved. He returned to the store hoping to sell his idea to the company.

The agent in charge of the New York business of the company was struck at once with Goodyear's ingenuity and hoped, as he had been able to make one valuable suggestion, that he might make another of infinitely greater value, so he took him into his confidence at once, and told him that they did not care to buy his improvement on the life-preserver, for the simple fact that the whole rubber business was on the verge of collapse, as the company had made up a great quantity of goods during the cool months of the preceding year and had distributed them quite widely, only to discover when the warm weather of summer came on that all these rubber goods—shoes, coats, life-preservers and all the rest—had a fatal tendency to melt. If Goodyear could discover some remedy for this difficulty, the storekeeper told him that his fortune would be made.

Thirty years later, after Goodyear's wonderful achievements, and after the great honors that the English and French governments had bestowed upon him, he was in London when he encountered the statement in some publication that twenty human beings were drowned every hour of the day. It made a deep impression on him, and he immediately fell into one of those moods of abstraction to which he was given when he was trying to solve some new rubber problem. He brooded on the matter so much that he was unable to sleep, and his wife, fearing the results of the continued strain, asked him to get his mind on some other subject and try to sleep.

"Sleep," he replied; "how can I sleep while twenty human beings are drowning every hour, and I am the man who can save them?"

It was Goodyear's hope to invent something that would effectually stop this great loss of human life by drowning. He sought to discover some way of converting into a life-preserver some customary article of apparel, like the hat, or coat; and he even sought to devise some sort of necktie that could be inflated and thus keep a person afloat. He thought that every detachable article on shipboard—every table, every chair and stool—ought to be so constructed as to serve as a life-preserver. Though he died before carrying this work to a thoroughly successful completion, many of his ideas were later embodied in sundry life-preserving devices.

About forty-five years ago, a few years after

Goodyear's death, an inventor constructed an all-india-rubber suit, which should not only serve to keep the wearer afloat but should provide sustenance for some time. For this purpose it had a receptacle sufficient to store a little supply of drinking water and another receptacle to hold food enough for several days.

Furthermore, the suit was so contrived that the wearer could fix himself upright in the water or recline on one side or the other, or on his back. With each suit was a paddle. The price was moderate. The practicability of the suit and its good wearing qualities under long and hard usage were demonstrated by the late Paul Boyton before the naval boards of all nations and under rigorously conducted tests made to interest the principal foreign and domestic steamship companies.

In an endurance test in Russia, Boyton, in his india-rubber suit with the receptacles for food and drinking water, remained forty-eight hours in the water, when the atmosphere as recorded by a Fahrenheit thermometer was 20 to 30 degrees below zero. The tests were carried out under the direction of Admiral Popoff and staff, and were highly successful. In the following winter,



CAPTAIN BOYTON ENJOYING AN OCEAN SAIL AND A CIGAR.

four men garbed in the Boyton pattern of life-saving suits made the round trip between Calais and Dover in cold and stormy weather with comfort.

We can verify many kindred performances by reference to the periodicals of the later "seventies." One of the amusement features for big excursion boats at that time was to go seaward, put Boyton overboard, and, after he had paddled about for a while to watch him prepare a hot meal for himself on the rolling waters.

The United States, the French and the British navies recommended the purchase of a few Boyton suits, but this encouragement was not enough to save the enterprise from disaster, and the investors lost the half million which they put in the project. It has been said that the main factor against the sale of the invention was the conservatism of ship owners, who considered the old life-preserver of cork and canvas quite good enough. This is hardly correct. It was not conservatism but economy that constituted the prime obstacle to adoption. A cork life-belt cost comparatively but a trifle, and where the crews were numerous and the passenger lists big, this phase of the matter made the supplying of Boyton suits impracticable. Indeed, the exigencies of "business" rather than the need of improved safeguards for travelers upon the water have generally prevailed, unless legislative enactments have forced changes.

It is a matter of common knowledge that life-boats have been carried for years without being put in the water, and cork life-belts have become virtually useless through dry rot in the course of years of non-use. Ship owners, therefore, have widely grown to look upon these protective facilities much in the light of wasteful expenditures—capital that they could have used to their own profit in other directions. Every conference dealing with safety upon the sea has met with no end of opposition whenever it undertook to declare certain things to be needful for the better security of travelers and crews. It is apparent, then, that the inventor must labor in the direction of economy and for the attainment of efficiency plus compactness. This explains the reason for so many of the life-belts and life-vests and -jackets that have come into being of late years.



LIFE-PRESERVING DEVICE OF FIFTEEN YEARS AGO.
Consisting of Coil of Rubber Tubing with Mouthpiece.

Rubber has seemed the ideal material for most of these latter-day inventions, its elasticity permitting an article of small compass to be filled with air to provide the desired measure of buoyancy, while combining both water- and air-tightness. Some of our illustrations clearly indicate the general trend of these devices. In one case, we have a man inflating the annular folds of a rubber belt, and a modification of this idea is found in a double-walled waistcoat—the compartments being readily inflated by the wearer. Naturally, the man seeking protection in this fashion would wear the article of dress described whenever he ventured upon the water, and certainly there would be reassurance in knowing that it would not be necessary to rush for a cork life-



ONE OF THE EARLY LIFE-PRESERVING VESTS.

belt in the moment of danger and possibly not be able to reach it in time.

For a good many years the United States Life Saving Service, now merged in the United States Coast Guard, tested all sorts of life-saving apparatus of reasonable promise, and many of these have been and are extremely ingenious. One of them reported upon in 1890 showed plainly the pioneer influence of Boyton. This suit was of two parts—head cover and a one-piece garment for the entire body—not unlike a modified diving dress. The hood covered the head completely and had wire-gauze panels in the face for the admission of light and air and to enable the wearer to look out. The body portion was gathered in around the neck by a drawing-string, and the hood secured outside of this band. The suit was composed of rubber cloth, and for additional buoyancy there were rubber floats arranged on a belt to be fastened about the waist. About the same time an inflatable rubber belt, capable of being filled by means of an air bulb, was offered to the service for trial. The buoyant tubes were made of rubber.

The Bunsen life-saving and swimming apparatus was submitted for test in 1900. The life-preserver consisted of three rubber sacks encased in saten covers. The sacks were designed to be strapped about the body and to be inflated through small rubber tubes, which closed automatically by spring clamps. The swimming attachment consisted of umbrella-shaped propellers,



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DONNING THE EDLUND LIFE-PRESERVING SUIT.



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AS THE EDLUND SUIT LOOKS ON THE WATER.

attached to the wrists and ankles by elastic bands. The idea was that the propellers would open and shut with the movements of a swimmer's limbs and thus propel him through the water. The official board, while recognizing the possible usefulness of such an equipment, considered the apparatus rather cumbersome and not susceptible of quick adjustment.

The same year the Life-Saving Service had submitted to it the McNicholas life-preserver. This device consisted of a rubber-sleeveless coat containing air chambers capable of being inflated by the wearer by means of air tubes. Leather flaps were attached to the hands and feet to aid the wearer when swimming. There was a mirror which could be elevated to a position perpendicular to the body to show the wearer while swimming upon his back any obstructions that he may approach. Two bags were attached about the waist, partly inflated to give them buoyancy, and designed to carry provisions and water. It was an ingenious device but not adapted to the requirements of the service.

Only a few years ago the Life-Saving Service examined the Rader life-preserver. According to the official report this affair consists of a vest or sleeveless coat, made of rubber-lined cloth, and provided with a number of air pockets capable of being inflated by means of a tube or mouthpiece that could be sealed by a screw valve. As will be seen, there is a persistent similarity of effort and general form present in most of these inventions. Today, the "Gieve" life-saving waistcoat, an English invention, gives us a modification of a combined garment for every-day wear and an inflatable rubber ring or belt. It is a good illustration of compactness, efficiency and readiness. The wearer has only to blow air into it through a small flexible tube and he is insured ample buoyancy for keeping his head and shoulders above the water.

One of the particular advantages of the rubber life-belt is that its proportions can be made such that it will not interfere with the motions of swimming while yet providing the needful sustaining buoyancy. With the cork life-belt, on the other hand, the thing is so bulky that it seriously hampers efforts towards self-propulsion, and the ultimate safety of the wearer may frequently depend upon his reaching some definite goal or point. So well is this matter of compactness recognized as a desideratum that in thousands of pleasure craft and in nearly all modern submarines—where space is decidedly precious—the life-preservers are made of rubber and are inflatable. In under-water boats this is particularly important, because the passages of escape are narrow, and men wearing cork life-preservers would find it extremely difficult if not impossible to get out of a sinking submarine through the average hatchway.

Possibly one of the most ingenious affairs of recent design is the life-saving handbag invented by John L. Edlund, a Norwegian. Ordinarily, this grip has the outward appearance of a handbag of goodly proportions, and can actually be used as such. But when turned inside out the thing becomes a one-piece garment made up largely

of rubber-lined cloth into which the owner can crawl and seal himself water-tight before jumping overboard. There is a dead-light fitted with a glass plate which permits him to look out, and a couple of valves in the top of the arrangement provide a way for the admission of fresh air. As one of our illustrations shows, a man weighing 160 pounds does not overtax the reserve of buoyancy; and by putting his hands in the hollow flippers it is possible for the occupant of this garment to propel himself through the water. Food and water sufficient for a number of days can be carried inside of this novel dress. The prime objection that can be offered to the equipment is that the bag on shipboard would be filled with things and probably stored in the owner's stateroom when urgently needed. In other words, it would be inaccessible if the vessel were sinking rapidly.

A somewhat kindred although not exactly similar life-saving suit has recently been invented by a German engineer, and for water tightness a rubber fabric is relied upon. In this case, the feet are not free to assist in self-propulsion, and in order to maintain the dress upright when occupied and in the water, a perforated metal bucket forms the lower end of the suit. The weight of this, when filled with water, keeps that part of the dress lowermost. The whole suit is packed in this can when not in service. A still closer return to Paul Boyton's outfit is that recently invented by Carl G. Walle, of Brooklyn, N. Y. He has a three-piece suit of rubber fabric consisting of a water-tight hood, a jacket, and trousers with rubber boots attached.

In order to bring the history of life-preservers down to the latest moment, mention should be made of a device demonstrated in New York harbor on the 16th of last month by Mr. Youngren, of Wyoming. This consists of a



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EQUIPPED IN THE YOUNGREN SUIT,
READY FOR THE PLUNGE.



THE GIEVE INFLATABLE
WAISTCOAT.



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FLOATING ON THE SEA IN THE YOUNGREN SUIT.

waterproof union suit of rubberized fabric which entirely envelops the body, fitting tightly, with an elastic band around the neck. Buoyancy is afforded by a belt which goes around the

waist and over the shoulders, made of kapoc, a new substance resembling cotton. In order to keep the figure in an upright position, 5-pound lead weights are placed at the feet. The outside pressure of the water naturally sends the air within the suit up around the neck and shoulders, making an additional agency for keeping the body upright.

The inventor believes that by the use of this suit the shipwrecked mariner may not only float for several days, but float in comparative comfort, having a supply of food and water. The latter is provided for by a rubber bottle attached at the waist outside of the suit and furnished with a rubber tube long enough to reach the mouth. The food is kept inside the suit and by simply slipping the elastic neckband up to the forehead the wearer can eat in dry comfort. The weight of the entire suit is 15 pounds, and it can be folded into comparatively small compass. The first of the two accompanying illustrations shows the wearer of the suit prepared for his plunge into the water, and the second shows him comfortably floating about on the surface.

To save persons from drowning has a twofold phase. The first, that of keeping them from sinking, has been the aim of the various apparatus we have already described in which rubber figures so importantly; but it is no less desirable that some ready means be provided for the recovery of those that have gone to the bottom and yet can be resuscitated if brought to the surface for treatment soon enough. The Germans have undoubtedly blazed the way in this latter effort, and the well-known Draegerwerk, at Luebeck, has evolved an exceedingly efficient and novel equipment for just such vital emergencies, and a great many of these are now in use abroad.

Hitherto in drowning accidents where the body has been carried out by currents or undertow, the only sort of rescue work has been by means of diving apparatus which, of course,

ment can be put on in a few seconds, gives the rescuer unlimited freedom of movement, and makes him independent of external air supplies for at least a half hour. The diver carries with him

his own air supply in steel bottles filled with compressed oxygen, which regenerates the air confined within the helmet. In a general way in construction and operation this apparatus is similar to that used in rescue work in smoke and noxious fumes, which was described in detail in the issue of this publication for March, 1915.

After donning the Draeger outfit, the rescuer jumps into the water over the spot where the body is believed to be, and is immediately carried to the bottom by means of weights. He can move about till he finds the body. He then encircles it with a rubber belt which he inflates from a small steel bottle of compressed air. The body immediately rises to the surface and the rescuer, detaching his weights, rises with it. This apparatus is a part of the equipment of the crews on the German submarines, as was mentioned in the article on "Rubber's Vital Part in the Submarine," in the issue of THE INDIA RUBBER WORLD for last June.

The British have evolved an escape dress for a like service in submarines, and the well-known English firm of Siebe, Gorman & Co. is directly responsible for this development in which water-tightness is obtained by the generous use of rubber. Our illustrations suffice to give an excellent idea of this outfit and its working. Like the German Draeger dress, the English equipment is provided with a combined purifier and oxygen

generator. A man so confined need not lack for fresh air for a considerable period. When the surface is reached, the wearer is able to inflate a flexible chamber which surrounds the jacket, forming a life-belt, and then he can open the glazed port in the front of the helmet and breathe freely from the atmosphere. Siebe, Gorman & Co. have supplied many hundreds of these rescue outfits for the British and other foreign services.

It would take a long list to cover the manifold forms rubber has taken in the effort to provide means to keep people afloat and to prevent their drowning. Many thousands of these are in use today. Besides these, other buoyant rubber devices are in continual use in the teaching of people to swim or in making it possible for them to venture into the water quite free from any risk.

If human ingenuity can accomplish it, Goodyear's dream of some device universally effective in saving human beings from drowning will yet come true.



THE SILBE-GORMAN LIFE-SAVING OUTFIT FOR SUBMARINE SERVICE.



THE SIEBE-GORMAN APPARATUS AT THE SURFACE. The wearer has inflated his life-belt and has opened the helmet face plate.

necessitated a supply of air, from above the surface of the water, and consequently required a pumping crew. In most cases there was no such apparatus available, and even where it was it proved cumbersome and slow to operate, while naturally it greatly restricted the movements of the diver. The new Draeger equip-



THE DRAEGER APPARATUS FOR RESCUING THE DROWNED.

What the Rubber Chemists Are Doing.

SOLUTIONED fabrics used in building automobile tire casings may be injured by action of sulphurous or sulphuric acid formed during the vulcanization process. Protection against this possibility may be secured by impregnating the fabric, previous to solutioning, with such salts as the double sulphates of zinc and ammonium, magnesium and ammonium, or acetate or carbonate of ammonium. The amount of these salts should vary from five to thirty per cent. of the rubber employed in the tire, and it desired may be added to the rubber solution as a compounding ingredient.

V. Cayla, in a recent issue of "Le Caoutchouc & la Gutta-Percha," writes on the use of sodium bisulphite in the preparation of plantation rubber.

The object of using bisulphite of soda is to preserve the light color of plantation rubber by retarding oxidation. The matter, therefore, does not concern smoked sheets, biscuits or fine hard Para, which are always dark in color.

Without the use of bisulphite, plantation varieties, after being prepared, frequently show grayish in color, more or less dark, sometimes with dark stripes on a lighter ground. This coloration is not due to the incorporation of impurities in the crude gum but to chemical modification. It is a much discussed point whether this modification has any effect on the rubber from the manufacturer's standpoint. It is a fact that lack of uniformity in appearance substantially depreciates the value of the rubber with purchasers, practically irrespective of other more important qualities.

The cause of this loss and inconvenience to plantation rubber producers was first overcome in the Federated Malay States by the addition of bisulphite of sodium to the rubber latex. Practically all the pale crepe is now so prepared. Plantation practice varies with circumstances. An authority, Mr. Barrowcliff, makes the following statement regarding the proportions of bisulphite employed: The minimum proportion of bisulphite that produces any effect on the color of the rubber is one part of bisulphite to 6,500 parts of latex. This amount gives fine crepe and sheet rubber. It corresponds with the addition of one half ounce per gallon of latex, of five per cent. bisulphite solution in water. Thin sheets with a strong tendency to oxidize and intended for smoking, and undiluted latex especially rich in rubber require an ounce of five per cent. solution to 3,250 of latex. Barrowcliff recommends, for the preparation of pale crepe, the use of one part of bisulphite solution in 1,000 of latex, although one part to 400 of latex may be used for the thinnest crepe. The presence of bisulphite in rubber impedes its drying; consequently in the preparation of thick stock small proportions only are employed.

B. J. Eaton prescribes two ounces of bisulphite to ten gallons of latex containing 15 pounds of rubber.

Vulcanization tests made in the Federated Malay States have shown bisulphite-treated rubber to be equal, not to say superior to that untreated. Manufacturers have, however, declared that rubber so treated loses quality and has a tendency to become brittle. These conclusions of the manufacturers are quite contrary to those published by Barrowcliff in 1912, who stated that bisulphite needed to be used only in small quantities and that it was entirely eliminated from the rubber.

Clayton Beadle, H. P. Stevens and Sydney Morgan, in their study of the effect of bisulphite in preparing rubber from latex, compared the properties of bisulphite-treated and untreated samples of rubber under identical conditions. They found very little difference between these samples, but proved that those treated with bisulphite were slightly superior to the others and concluded that bisulphite is excellent in its effect in obtaining uniformly pale rubber.

The inconvenience of using bisulphite is that the treated rubber dries rather slowly, requiring from two to three days extra. It is also more difficult to smoke. For this reason the proportion of bisulphite must be adjusted to the amount required to stop oxidation, and at the same time not substantially retard the drying of the rubber. Otherwise the formation of mildew will be facilitated, which means spotted rubber and other undesirable conditions. Therefore, each planter must experiment for himself to determine the quantity of bisulphite to add to his particular quality of latex.

Barrowcliff mentions that excessive use of bisulphite may cause formation of sulphuric acid, causing detrimental effects. This is not supported by the results of Beadle, Stevens and Morgan, who state that traces of sulphite are often found in rubber not prepared with bisulphite. They have also preserved rubber prepared with sulphuric acid for five years without noting any alteration, thus proving that the presence of sulphuric acid is not injurious to rubber. Bisulphite-treated rubber is unquestionably good and satisfies the demand for the lightest-colored rubber for specific uses. Color is not an indication either of quality or lack of quality.

NEW PROCESSES IN RUBBER MANUFACTURE.

METHOD OF PROOFING FABRICS.—United States patent No. 1,154,875, James Meade. First a light coating which is partially dried, and then a heavy coating on which second layer of fabric is pressed. The machine is described in this issue.

MAKING RUBBER BANDS.—United States patent No. 1,155,325, Thomas W. Miller, assignor to The Faultless Rubber Co. Rubber is molded in the form of a tube and vulcanized and then cut into bands.

MAKING SPONGY RUBBER.—United States patent No. 1,156,184, P. Schidrowitz and H. A. Goldsborough. (See THE INDIA RUBBER WORLD, July, 1915.) Coagulating rubber latex under conditions producing a porous or spongy coagulum and fixing the pores by vulcanization.

INSULATING COMPOSITION.—United States patent No. 1,156,452, L. H. Backeland, assignor to General Bakelite Co.

RUBBER PRESERVATIVE COMPOSITION.—United States patent No. 1,156,561, Samuel T. Smith.

VULCANIZING AND ATTACHING RUBBER.—United States patent 1,157,572, Frederick Moench. This process consists in applying a preliminary coating of rubber dissolved in a mixture of chloroform and gasoline, allowing the coating to dry, scratching the dried coating thoroughly into the face of the material and applying over it an unvulcanized rubber sheet coating; finally heating the rubber-coated article for an hour at 320 degrees F. for vulcanization.

MANUFACTURE OF A SEAMLESS RUBBER GLOVE WITH LINING OF EXPOSED ELASTIC FABRIC AND INTERMEDIATE LAYER OF ADHESIVE MATERIAL.—United States patent 1,157,646. Thos. W. Miller, assignor to The Faultless Rubber Co.

SUBSTITUTE FOR LAMBLACK.—United States patent No. 1,156,742, Bhardone, Nichols & Brugiere. Ground burned rice hulls.

TUBULAR CORDS.—British patent No. 12,629 (1914), J. D. Tew, Akron, Ohio. A number of strands impregnated with rubber are twisted together in tubular form. (See August issue.)

IMPREGNATING TEXTILE FABRICS WITH RUBBER SOLUTION.—British patent No. 17,097 (1914); G. W. Beldam and A. U. B. Ryall. The fabric on a roller is immersed in rubber solution and is wound off on another roller, also immersed in the solution, passing on its way, across the surface of one or more perforated, revolving rollers or between two plane-surfaced, perforated boxes, to the interior of which rubber solution is sup-

plied under pressure. This treatment causes the fabric to vibrate, producing a movement of the threads with the effect of assisting the penetration of the rubber solution into the goods.

COLLOIDAL SULPHUR.—French patent No. 446,692; Lumière. Crystallized hyposulphite of soda, 125 parts, dissolved in 1,000 parts of water, is mixed with a solution of dextrine, 200 parts, in 1,000 parts of water. To 300 volumes of the mixed solution, 60 volumes of 22-degree hydrochloric acid is added. The colloidal sulphur precipitated from the hyposulphite is separated by filtration, dried and used promptly, for it depolymerizes rapidly.

PATENTED TREATMENT OF RUBBER.

CONCENTRATED RUBBER LATEX.—British patent No. 24,680 (1914); Samuel Milne. A Scotch inventor proposes to concentrate rubber latex for delivery to manufacturers. The purpose of this treatment is to obviate the tedious manipulations and expensive plant required to secure dry rubber from the latex by the usual methods. The evaporation is conducted either at atmospheric pressure or in vacuum, and is not carried to the point of coagulation. The concentrated latex, while hot, is placed in suitable air-tight vessels for shipment.

The latex, prior to, during or after evaporation may be treated with any suitable preservative to prevent decay. It may also be treated under pressure to destroy by suitable temperature any germs which may induce decay, the resulting rubber not being impaired by temperatures considerably over the boiling point, at which all harmful germs would be destroyed. Thus treated and packed, rubber latex may be kept for comparatively long periods without deterioration and, when required, is in a form suitable for immediate use for a great variety of manufacturing purposes, with or without the addition of water. It can be mixed with almost any material and applied in many ways.

The concentrated latex may be further treated or dried to produce rubber in the usual form.

POLYMERIZATION OF BUTADIENE.—British patent No. 17,253 (1914); A. Heinemann. Isoprene, or a mixture of isoprene and butadiene, is dissolved in an equal volume of acetone, and sulphur dioxide is passed into the cooled solution for about four and one-half hours, or until a white precipitate ceases to form. The saturated solution is allowed to stand for four days. The precipitate is then separated and washed with acetone. When dry it has but little strength, but when molded for four days under a pressure of 6,000 pounds per square inch, to expel the oily substances, the product possesses great strength, and has properties similar to gutta percha and balata. It can be vulcanized by heat without further addition of sulphur, yielding a soft product or one similar to hard rubber.

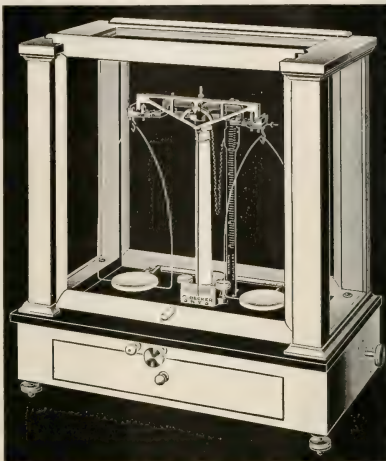
CAOUTCHOUC FROM ISOPRENE.—United States patent No. 1,146,253; A. Heinemann. A process for the production of caoutchouc from isoprene, by first passing a substance composed of oxygen through the isoprene while maintaining the latter at a low temperature and then heating the product for a time sufficient to effect polymerization.

LABORATORY APPARATUS.

IMPROVED ANALYTICAL BALANCE.

AT the recent National Exposition of Chemical Industries in New York, an improved direct reading analytical balance was shown which is attaining deserved popularity among analysts, who are prompt to appreciate its advantage over the ordinary balance, which necessitates a rider for fine weighing. The improvement is the use of a small chain so arranged that any proportion of its weight may be progressively added to or removed from the beam of the balance and the amount of this weight read directly. The use of this chain in lieu of fine weights and rider,

promises to revolutionize the design of delicate balances and their method of manipulation. Direct readings in milligrams and tenths are not only rendered possible by the device, but the time required to make a weighing is considerably reduced. The innovation is



due to the efforts of Christian Becker of New York, the well-known manufacturer of analytic balances.

To operate the new attachment a thumb screw at the side of the balance is rotated. This controls the position of a sliding block on a vertical graduated scale. The chain is suspended with one end attached to the beam and the other to the sliding block. Movement of this block adds more or less of the chain weight to the beam till balance is obtained. Altering the chain weight can take place while the beam is in motion and the weighing progress without interruption or opening the window of the balance. Milligrams are read from the long scale and tenths of milligrams by the vernier on the sliding block. The range of the chain weight is considerable. In one of the popular-size balances the chain will weigh from one-tenth milligram to 50 milligrams. By variation in the chain weight the graduated scale can be calibrated for finer or coarser weighing. The demand for the new balance is far in excess of the facilities of the manufacturers to supply it and demonstrates the prompt appreciation of the advantages offered by the radical departure in design. [Eimer & Amend, New York.]

RUBBER FILTER RINGS.

Two new forms of rubber filter rings for use with filtering crucibles are shown in the accompanying illustrations. One of these is entirely of soft rubber and the other of hard rubber

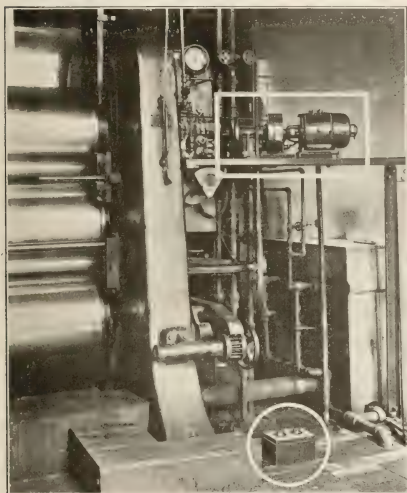


with soft rubber flanges (shown in the cross section). They are of special value where the unobstructed use of the entire sides and bottoms of porous filters is desired, as only about one-eighth of an inch of the upper rim is grasped in the ring. The device can be instantly applied or removed for cleaning and will fit any 60 degree funnel. It can be used with any filtering crucible on the market. [E. H. Sargent & Co., Chicago.]

New Machines and Appliances.

A MOTOR-OPERATED SCREWDOWN FOR CALENDERS.

CALENDER rolls require extremely accurate adjustment and are quite heavy. The result is the use of a hand-wheel screwdown mechanism which is geared very low and operated for a considerable period of time if the rolls are to be moved any distance. Whenever a calender is changed from frictioning to sheeting, it is necessary to drop



the bottom roll to have it completely clear the sheet of rubber which is delivered from the lower side of the middle roll.

Because the hand-wheel operating the screwdown mechanism must be revolved so many times and is an extremely tiresome job, calender operators drop the bottom roll barely enough to clear the sheet. As a result, a very considerable personal injury hazard is created, for there is a fair probability of a careless operator getting his fingers caught between the bottom and middle rolls. As a matter of fact, many accidents have occurred which were directly due to the hand-wheel.

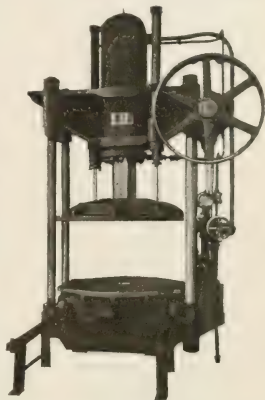
The accompanying sketch on this page shows diagrammatically the manner of installing a motor screwdown mechanism. In this, the hand-wheel ordinarily employed is removed and a sprocket wheel for silent chain drive substituted. The motor screwdown mechanism is placed at one side and operatively connected with the sprocket on the screwdown shaft by a suitable length of silent chain. The usual clutch for selecting top or bottom rolls is retained. Two control pedals, one for opening, the other for closing the rolls, take the place of the hand-wheel. The improvement is a notable one and will at once be appreciated by all practical rubber men. The old hand-wheel with its slow, laborious movement and the ever present element of danger in its use, can now be assigned to the scrap pile. [The Cutler-Hammer Clutch Co., Milwaukee, Wisconsin.]

SOUTHWARK SOLID TIRE PRESS.

This is a belt-driven 200-ton hydraulic press for forcing solid tires on rims.

One point of superiority is that the lower table is movable and very much lower than usual, which makes the handling of the tires much easier; while in practice, two men can turn out much more work than with the older type of press. Another advantage is that the ram is brought down through the idle stroke with tank pressure, therefore no power is required for doing actual work.

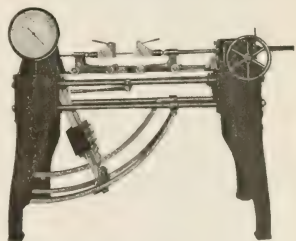
The machine is controlled from a patented operating valve so designed that at any time the press is at rest—either on the up or down stroke—the water is automatically by-passed. This feature eliminates the safety valves against which the pump frequently had to operate on other types of machines. [Southwark Foundry & Machine Co., Philadelphia, Pa.]



THE SCOTT FABRIC TESTER.

This tester is known as the horizontal type and is designed for heavy work. It has two heavy cast-iron frames holding four solid steel bars $1\frac{1}{2}$ inches in diameter.

Resistance to the pull on the sample is obtained by dead weight and there are no springs to influence the test. The recording head is a one-piece casting rigidly fastened to the frame. The main shaft rotates in two frictionless ball bearings protected by dust caps. On this shaft is affixed a large metal drum having a finished surface 4 inches in diameter to receive a chain connecting with the head clamp. Attached rigidly to each side of this drum are two finished steel bars heavily riveted at their lower ends to form one solid unit. These double bars carry the resistance weights, which are iron and made in sections for convenience in handling. The capacity of the machine is determined by the number of weights placed upon the levers. Two



rows of graduations can be placed upon the dial, the outer row reading from 0 to any capacity desired up to 2,000 pounds. The inner row may be made to read from 0 to any capacity desired so that by removing certain weights a more delicate machine is obtained for lighter materials. Thus a machine for tire fabrics may be constructed with a total capacity of 800 pounds, and by removing part of the weights a machine of 400 pounds capacity may be had for tapes, braids, etc.

Attached to the frame of the machine are two steel quadrants, the upper sides of which are provided with machine-cut teeth. On the outer sides of the weight levers are six steel pawls of varying length which engage the rack teeth and hold the weight levers and dial pointer at the exact position of the break. A third quadrant without teeth is suspended from the frame and passes between the weight levers connecting with a long hand lever on the head end of the machine. To reset the weight lever and dial hand, it is only necessary for the operator to pull this lever.

The driving mechanism is enclosed in a heavy iron box supported from the frame. The main driving shaft extends through this box in a horizontal position and is provided at the back with a pair of 10-inch tight and loose pulleys and shipping mechanism to receive a 1½-inch flat belt. A hand-wheel, which may be removed when not in use, is fitted to the front end of this shaft for experimental and research work.

When it is desirable to drive by motor, a small gear attachment is used to replace the tight and loose pulleys, increasing the speed in a ratio of 3 to 1, thus enabling the drive to be made by a single belt direct from a one-quarter H. P. motor placed on the floor under the machine. [Henry L. Scott & Co., Providence, Rhode Island.]

THE NUTTALL FLEXIBLE COUPLING.

Flexible couplings have almost entirely replaced rigid connections between driving and driven shafts in rubber mill practice, because they eliminate the necessity of exact shaft alignment and cushion the shocks of starting and stopping heavy mills and grinders. The Nuttall coupling owes its flexibility to rubber.

The "Type A" coupling shown in the illustration is made up of two cast-iron spiders with interlocking arms which are separated by cylinders of rubber, held in place by two steel rings

that are locked in the arms of the spiders.

Power is transmitted through the rubber cylinders, compressing them and obtaining flexibility through their resiliency.

Its simple construction makes this type more desirable than ordinary couplings and the ease of renewing the rubber cylinders makes the maintenance cost very low. [R. D. Nuttall Co., Pittsburgh, Pennsylvania.]

THE NILSON TILTING WIRE REEL.

The saving of time and physical exertion in loading coils of heavy wire on reels was the inventor's object in designing the tilting reel.

The operator trips the lever with his foot and the upper part is gradually lowered until the wire-carrying section is within a few inches of the floor. The guards are removed from the prongs, the coil of wire up-ended and slid upon the carrier. The guards are then replaced and the set screws tightened. When the lever is released the loaded reel is easily returned to its upright position by the operator. It can also be adjusted horizontally to feed flat wire. [The A. H. Nilson Machine Co., Bridgeport, Connecticut.]

PROTECTION OF ALTERNATING CURRENT MOTORS.

In alternating current motor installations it is common practice to provide means for automatically disconnecting the motor from the circuit in the event of sustained overload. It is also usual, except in the case of some small motors which can be thrown directly on the line under load to cut the motor out of circuit when the line voltage drops to a certain predetermined percentage of normal.

To provide for both overload and low-voltage protection of alternating current motors up to 2,500 volts and 300 amperes, the General Electric Co., of Schenectady, New York, has developed a new relay for use in conjunction with the usual type of G.E. low-voltage release and which is shown in the accompanying illustration.

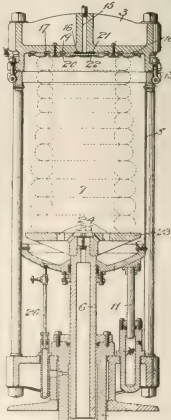
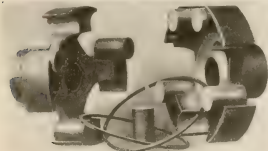
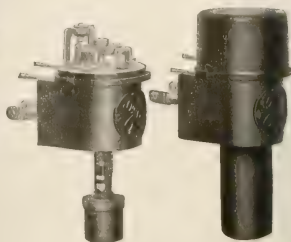
MACHINERY PATENTS.

PETER D. THROFF'S PRESS VULCANIZER.

THE vulcanizer to which this invention is applied, as shown in the illustration, is of the well-known vertical type used for curing the casings of pneumatic tires. The following description of the operation of the vulcanizer will explain the novel features of this invention.

Assuming the chamber 8 and platen 23 to be in their lowered position, the molds are stacked on the platen, and the stack is compressed against the head plate 17 by the ram 6. The auxiliary ram 11 is then put in operation, closing the chamber 8 against the head 3, where it is locked by the bolts 13. The steam, introduced through the inlet 13, impinges against the circular depression 21 in the plate 17, and is forced to travel therefrom through the grooves 16 and 19 to the outer portion of the head 3, and hence to the outer portion of the chamber 8. Upon reaching the outer portion, the steam passes down around the stack of tires 7, engaging the outer portions. When it reaches the bottom of the chamber 8 it is permitted to pass up through the holes 24 and 25 in the support 23, and thus come in contact with the inner portion of the stack of tires. Upon reaching the top of the vulcanizer it will again pass outwardly by way of the depression 22 and grooves 20, coming in contact a second time with the outer surfaces of the molds.

It will be seen that as long as the steam is admitted to the vulcanizer it will continue this cycle, thereby following a free and uniform circulation, and giving a uniform cure to the tires. The grooves 16, which are not in communication with the inlet



15, serve as additional channels of circulation during the curing period. When the cure is complete, the steam is let off through the blow-out 26, the support 23 and cylinder 8 depressed, and the tires removed. [Peter D. Thropp, assignor to The De Laski & Thropp Circular Woven Tire Co., United States patent No. 1,152,593.]

NIPPLE BEAD FORMING MACHINE.

Beads on nipples, medicine dropper bulbs, finger cots and similar articles are at present formed by hand, or in a mold. Mahoney's invention provides means whereby this work may be done mechanically in a rapid, economical and accurate manner.

In the accompanying plan view, the bodies of the nipples *A*, which are unvulcanized, are molded on the forms *B*. As the heads *D* on the operating rods (not shown) are brought into engagement with the cam plate *E*, the forms are applied to the chucks *C*. Then as the chucks pass out of engagement with the cam plate, the forms are clamped in place and both the form and chuck are rotated so that the forming roller *F* is brought into engagement with the form. The action of the roller is to turn the rough edge of the nipple outwardly, thus causing it to roll upon itself and form the desired bead. [J. L. Mahoney, United States patent No. 1,154,191.]

ROYLE'S MULTIPLE TUBING MACHINE HEAD.

This new tubing machine head is designed for the manufacture of a honeycomb pneumatic tube section for tires, as well as for multi-perforated tubes in general. In the side elevation of the machine *A* is the stock worm, *B* is the cylinder and *C* is the racket. The die *D* is held by the holder *E* and the tubular nut *F*. Into the web *G* of core bridge *H* is secured a gang of cores *I* with their free ends extending to the outer end of the die *D*. Another gang of cores *J* is secured into the web of the other bridge *K*, their ends also projecting outwards to the die. The inner ends of the core members pass through holes in the bridge webs and are secured by nuts screwed on their threaded inner ends.

The core members of the two gangs alternate in such a manner as to bring the outer ends of the two gangs in the desired relation to one another to produce the honeycomb structure desired. A V-shaped opening, shown in the front elevation, is made along the inner side of the tire by locating a tapered projection *L* at the mouth of the die. This opening is serviceable in applying the casing and tube section therein to the rim. [Vernon Royle, United States patent No. 1,152,978.]

MEADE'S MULTIPLE SPREADING AND DOUBLING APPARATUS.

In the illustration *A* and *B* are two rolls of fabric. From *A* the fabric *N* passes upward to spreader *C*, and from the gage knife *D* receives a light coat of waterproofing. It is dried by steam coils *E* as it passes up and around idler rollers to another spreader *F*, where it receives a heavier coating. The fabric *O*, from roll *B*, passes through a doubling device *G*. Here the two

fabrics are pressed together lightly and at *H* a second doubling device brings the two layers of fabric together without endangering the exposed surfaces. The goods are then passed over the heating drum *I*, after which they pass under the hood *J* into an upward current of air. At *K* is another doubler where heavy



pressure is exerted on the goods, which then pass through the measuring device *L* and are wound on the core *M*. [James Meade, United States patent No. 1,154,874.]

OTHER MACHINERY PATENTS.

UNITED STATES OF AMERICA.

ISSUED SEPTEMBER 21, 1915.

1,154,419 Machine for applying cement to the margin of flexible material. William F. Lautenschlager, Cincinnati, Ohio.

ISSUED SEPTEMBER 28, 1915.

1,154,663 Schlossope for testing hardness of materials. William F. Shore, assignor to The Shore Instrument and Manufacturing Co., New York.

1,154,737 Repair vulcanizer. William F. Stearns, Exeter, N. H.

1,154,843 Collapsible core. J. H. Coffey and J. H. Coffey, Jr., Toronto, Canada, assignors of one-half to Gutta Percha and Rubber Limited, Toronto, Canada.

1,154,964 Braider mechanism. Frank Bently, Watertown, Mass., assignor to Simplex Wire and Cable Co., Cambridge, Mass.

Reissue.

1,154,988 Soft metal mold. William Eggers, New York, N. Y.

ISSUED OCTOBER 5, 1915.

1,155,445 Smoothing and graining insulated wire windings. Adolf Emckel, Charlottenberg, Germany, assignor to Siemens-Schuckertwerke G. M. B. H., a corporation of Germany.

1,155,909 Repair vulcanizer. Frank L. Gibson, Fender, Neb.

ISSUED OCTOBER 12, 1915.

1,156,096 Apparatus for treating plastic material. Raymond B. Price, New York, N. Y., assignor to Rubber Regeneration Company, a corporation of Indiana.

1,156,180 Pneumatic tire mold. William A. Robbins, Glen Ridge, N. J.

1,156,170 Collapsible core. Paul E. Welton, Akron, Ohio, assignor to Katherine B. Welton, Akron, Ohio.

1,156,793 Repair vulcanizer. Abel Magari and Arthur A. Grotthaus, East Washington, N. Y.

UNITED KINGDOM.

ISSUED SEPTEMBER 15, 1915.

1,156,194 Machine for covering wire, cord and cables by winding. E. W. Cowper, 41 Condon Road, Chesham.

1,156,195 Knitting, weaving and pressing fabrics for heavy belting. S. A. Aron, 1011 Exposition des Produits Westinghouse, London, England, 2 Rue de Belin, Paris.

1,156,196 Cord making apparatus. J. D. Tew, Akron, Ohio, assignor to J. D. Tew & Co., Akron, Ohio, August 1, 1915.

ISSUED SEPTEMBER 22, 1915.

1,156,889 Golf ball mold. P. A. Martin, 31 Westfield Road, Edgaston, and J. Stanke, 20 Ivor Road, Sparkhill, Birmingham.

1,156,890 Electric vulcanizer for tires, tubes and insulated wires. W. J. Hendry's Telegraph Works Co., 11 Bloomsbury Street, London, W.1, and H. Savage, 27 Westcliffe Park Road, Blackheath—both in London.

1,156,891 Treating machine. J. C. Morton, Cambridge, Mass., U. S. A.

ISSUED SEPTEMBER 29, 1915.

1,156,892 Solid tire mold. A. Cookson, 10 Merchiston Park, London.

THE FRENCH REPUBLIC.

476,059 (April 1, 1914). Composing substance and method for preparing rubber goods. P. Reber, Paris.

476,110 (August 25). Process and machine for manufacturing tires. M. S. Rubber Co., U. S. A.

476,259 (October 5). Improved compression roller. H. A. Williams.

The Editor's Book Table.

REPORT OF THE INTERNATIONAL RUBBER CONGRESS AND Exhibition, Batavia, October 19-23, 1914. Published in English by Filial Albrecht & Co., Batavia, Java. (Cloth, 8vo., 297 pages. Illustrated.)

WHILE, naturally, this report concerns itself largely with rubber planting and will in consequence be interesting chiefly to planters, still it contains some chapters on other phases of the rubber industry which will be found of value to those whose connection with rubber lies quite outside the planting interests.

The 1914 Batavia Rubber Congress and Exhibition was the second of its kind to be held in Java, the former having been held in the same city in December, 1907. The first congress was held at a time when the rubber planting industry was practically in its infancy, when many important people still doubted its success, and when rubber planters worked more or less in the dark, searching to discover the best methods for cultivating rubber trees and preparing their product for market. The 1914 Batavia Rubber Congress and Exhibition was a demonstration of the tremendous strides that have been made by the rubber planting industry during the last few years.

It was originally planned to open the exhibition on September 8, but the war made it necessary to postpone the opening ceremonies until October 19, when the official inauguration occurred in the presence of His Excellency, the Governor-General of Netherlands India.

Owing to the war many foreign members, among them the editor of *THE INDIA RUBBER WORLD*, were unable to reach Batavia to deliver the addresses they had prepared for the occasion.

On the first day of the congress, following the inaugural ceremonies, debates were held regarding the selection of *Hevea* for plantation purposes; the diseases and pests of plantation *Hevea* and the significance of branching in young trees. Mr. G. F. A. Steenkamp explained the exhibits of the General Planters' Association of the East Coast of Sumatra.

Catch crops, mixed cultures, planting distance and thinning-out were discussed on the second day. These discussions were followed by demonstrations of scientific methods for testing rubber by J. G. Fol, chemical engineer attached to the Netherlands Government Rubber Experimental Station in Java. The third day of the congress was given over to the consideration of artificial manure, tapping and tapping methods, and the preparation of rubber. The fourth day witnessed the closing of the congress with the usual accompaniment of speeches and distribution of prizes. But before the closing addresses, Mr. Fol was again heard in a paper on scientific testing as opposed to empirical methods of determining the value of rubber.

All these discussions, conferences, lectures and addresses, together with the composition and decisions of the jury, are given in full in this report; also the papers which, owing to the war, could not be delivered at the congress by their respective authors.

THE INDIA RUBBER WORLD of January, 1915, gave a complete list of prizes at the Batavia Rubber Exhibition as well as Henry C. Pearson's paper on "What Rubber Manufacturers Want in Crude Rubber." Other papers, not delivered at the congress but published in full in the report are: "Science and Tropical Agriculture," by Dr. F. A. F. Went, of Utrecht, Holland; "Progress Made in the Investigation of Hereditary Transmission and Its Importance in the Cultivation of Tropical Plantation Plants," by Dr. Erwin Baur, of Berlin (reported in German); "The Present Status in the Production of Artificial Rubber," by Dr. Willy Hinrichsen, of Berlin (reported in German); "Short Resumé of an Experiment in Period Tapping," by H. Wulf Walters, of Ceylon; and "Farming with Dynamite," by Harold Hamel Smith, editor of "Tropical Life."

RUBBER MACHINERY. BY HENRY C. PEARSON. PUBLISHED by *THE INDIA RUBBER WORLD*, New York. [Cloth 8 vo., 419 pages, 428 illustrations. Price \$6.00.]

The remarkable development of the rubber manufacturing industry has proved a great incentive to inventive ingenuity and mechanical skill. There has been a constant succession of new machines to meet the new problems of this rapidly growing branch of manufacture. Some of these have been tried and discarded as inefficient, while others have found a permanent place in rubber factories, albeit, in most instances changed and added to from time to time. To the invention of new machines and the development of old appliances, there has been no end. Yet, during the fifty years in which this process has been going on, no attempt has ever been made to tell adequately the story of this great mechanical development until Henry C. Pearson, editor of *THE INDIA RUBBER WORLD*, took up the task some two years ago. The results of these months of labor are given in this volume just from the press.

The book covers, in a general way, the whole subject of machinery used in the preparation of crude, compounded and reclaimed rubber. The first four chapters have to do with machines used in the basic operations of crude rubber washing, drying and compounding. And adequate mention is made of the important part cotton fabrics play in rubber manufacture and the mechanisms used in preparing cloth for coating.

The chapter on calendars shows the great advancement from Chaffee's crude machine to the perfected modern giant with motor-drive. The kinetics of washers, mills and calendars are fully covered in the chapter on clutches and drives, including the humanitarian safety stops.

Vulcanizers are given adequate space and generous illustration. General types are shown that have to do with curing by heat, steam, water, air, and electric, sulphur and ultraviolet rays; and also the cold cure apparatus for immersing the uncured rubber in a bath of chloride of sulphur or treating it to chloride of sulphur fumes. There are vulcanizing presses, screw and hydraulic, of the single and multiple ram type, with one, two and even seven platens. The enormous power and great capacity of the modern press vulcanizers described and illustrated reflect the insistent demand of the tire industry.

Tubing was formerly made wholly by hand. The author tells how the long, laborious process has been superseded by powerful machines that force the plastic rubber through intricate dies emerging in the form of tubes, solid tires, cushion tires and a great variety of mechanical rubber goods.

There are two exhaustive chapters on spreading, doubling and surface-finishing machines used in coating the surface of a sheet of fabric with rubber. The development from the original Hancock spreader to the present-day machine of accurate operation is shown by English and French, as well as American types. The vulcanizing of proofed fabrics by the electric, vapor and cold-curing processes—the methods and machines employed in impregnation and proofing and the final solvent recovery are fully described. Then follows the chapter on cement and solution making that shows the American, English and German advancement in this important part of the industry.

The first of the two chapters on extraction covers the apparatus used in separating rubber and gutta from shrubs, vines, roots and leaves. It includes guayule extraction and the German and French methods of extracting gutta percha from leaves, and is followed by desinuating apparatus.

How the vast quantities of rubber scrap are reclaimed and restored in useful form to the rubber manufacturer is concisely described in the two chapters on Reclaiming.

The great variety of instruments for recording and controlling temperature and pressure during vulcanization of rubber goods is given in detail. The book closes with a complete story in text, half-tone and outline illustration of the apparatus and machines used in the rubber laboratory; while the last, and to many the most important feature of this valuable book is the comprehensive and carefully prepared subject index.

HENDRICKS'S COMMERCIAL DIRECTORY OF THE UNITED STATES for buyers and sellers. S. E. Hendricks Co., Inc., New York, 1915. [Quarto, 1,503 pages. Price 10 dollars.]

This commercial register was founded in 1891 and the present volume is its 24th annual edition. Attention has often been called in this department to the wonderful completeness of this monumental work and the accuracy with which the compilation is made. The present volume contains 1,503 pages. This is about 90 pages less than the edition of a year ago, but this does not indicate that there is less matter. On the contrary, the edition of a year ago has been revised with extreme care and everything eliminated from it that was not of a strictly current and useful character. So that while this present volume contains fewer pages than its immediate predecessor it has in reality quite a good deal of new information that has not hitherto appeared in this register.

Another pleasing feature of this latest edition is the fact that it is printed from entirely new type, which gives every page a clean and attractive appearance. This edition is also bound in leather instead of in cloth, as has hitherto been the case.

Probably most of the readers of this publication are familiar with this standard work, but to any who may not be it need only be stated that it is a complete register of practically every American industry, giving under a comprehensive system of classification and sub-classification the producers, manufacturers, dealers, and large consumers connected with all the important American industries, including railroad engineering, contracting, architectural construction, mining, quarrying, and every line of manufacture. To show the completeness of the work, it might be added that the index alone, printed four columns to a page, occupies 147 pages.

NEW TRADE PUBLICATIONS.

AN ILLUSTRATED CATALOG OF CHEMICAL LABORATORY SUPPLIES.

AN illustrated, descriptive catalog of chemical and assay laboratory supplies (483 pages) bound in loose leaf covers, has been received from Eimer & Amend, 205 Third avenue, New York. The book is a series of special circulars or pamphlets fastened in adjustable covers. This form has been adopted pending the publication of a new edition of the regular bound catalog, which apparently must wait for settled conditions in the matter of foreign importations. In certain lines American-made substitutes are being supplied.

A MEMORANDUM BOOK FROM WOOD-MILNE, LIMITED.

Wood-Milne, Limited, of Preston, England, whose specialties are rubber heels, solid pneumatic tires and golf balls, have favored their friends and customers with an attractive little memorandum book, $3\frac{1}{2} \times 6$ inches, or in other words just convenient pocket size. It contains the calendar for the present year and for 1916, a page where the owner can jot down certain personal matters like his telephone number, watch number, size of gloves, and other similar memoranda that is liable to escape one's memory, and, in addition, has several pages of general information, some of it useful chiefly to people in England, but the rest equally useful everywhere else. The remainder of the book consists of blank pages for memoranda, with a number of leaves specially ruled for an expense account. The pages are finished with a gilt edge and inserted in suede leather

covers provided on the inside with pockets for bills, stamps and tickets—together a useful little volume.

STANDARDS FOR RUBBER-COVERED WIRES AND CABLES.

This is a 126-page, illustrated manual published by the Underwriters' Laboratories, Inc., Chicago, for the benefit and service of users of rubber insulated wires and cables for electric lighting and power circuits. This manual, which appears to have been prepared with great care, describes in detail the system of label service of the Underwriters' Laboratories, the specifications and tests prescribed by the National Electric Code for rubber insulated wires and cables, the Laboratories' methods for testing rubber compounds used for such electrical insulations and their system of following-up and testing market samples of articles bearing their labels.

To facilitate the insertion of additional matter this manual has been bound in loose leaf form, a very obvious convenience.

"THE APPLICATIONS OF CHEMICALS IN THE PREPARATION OF RUBBER."

This pamphlet of 24 pages is from the pen of Dr. A. J. Uthée, and is published in the Dutch language by H. van Ingen, Surabaya, Java. It treats of the different chemicals used in the preparation of rubber—coagulants, anti-coagulants and bleaching and disinfecting agents. A brief appendix describes some of the diseases and pests affecting plantation *Hevea*.

DISEASES AND PESTS OF THE HEVEA BRASILIENSIS IN JAVA.

This is a report by Dr. A. A. L. Rutgers and Dr. K. W. Dammernann of the work of the Department of Plant Diseases in the Netherlands Indies, published by the Department of Agriculture at Batavia, in the form of a paper-covered booklet, quarto size, 45 pages. It is published in Dutch and in addition to the text has a number of good-sized illustrations showing the effect upon the *Hevea* tree of the various diseases and pests described.

Like many trees growing far away from their aboriginal land, the *Hevea Brasiliensis*, in the plantations of Java, is subject to a number of more or less serious diseases affecting its roots, trunk, branches and leaves. Animal pests such as wild pigs, rabbits and crickets also cause considerable damage to plantation *Hevea*. The authors have made exhaustive studies of these diseases and pests, of their causes and remedies and the results of these studies are reported in this book, which is well illustrated by photographic cuts and should be of important service to rubber planters in the East.

GOODRICH NEWS SERVICE.

The news service department of The B. F. Goodrich Co. is publishing photographs, in the form of posters 13 inches square, of current events of general interest showing, incidentally, the wide use of Goodrich tires. These posters are furnished to Goodrich dealers, together with gummed strips for pasting them in their show windows. The size and topical interest of these pictures are sure to attract the attention of passersby and fix the Goodrich trade marks in the minds of those among them who are tire users.

A LEATHER CASE FOR A BUNCH OF KEYS.

The Somerset Rubber Reclaiming Works, of New Brunswick, New Jersey, has recently distributed a useful little souvenir in the shape of a leather cover for the bunch of keys which every well-ordered man carries. A feature of value lies in a metal check, stamped with a number, which is registered at the Somerset works. Should the keys be lost, they would naturally be returned to the company, which in turn would be able to locate the owner.

"Rubber Machinery," Mr. Pearson's newest book, filled with valuable information for rubber manufacturers, is now ready for mailing. Price, \$6.

New Goods and Specialties.

A RUBBER COMB WITH STAGGERED TEETH.

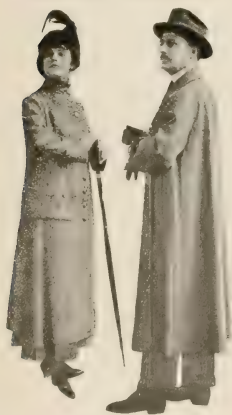
THOSE with scanty locks little realize what discomforts accompany the combing of heavy and curly hair with the ordinary comb. For the possessor of luxuriant locks, the "Climax" comb is an unmixed blessing. The teeth of this comb are set in staggered formation, projecting alternately on either side, and at the base of each tooth there is an opening in the form of a large loop—thus securing a minimum of friction and allowing the comb to pass easily through the hair. The loop construction also makes the teeth more flexible and adds greatly to the strength of the comb as a whole. The manufacturers of the Climax



state that it is practically impossible to break this comb by use. American Hard Rubber Co., New York.]

WEATHERPROOF CLOTHING.

To reproduce illustrations of all the new fall and winter styles in weatherproof clothing would require considerable space;



therefore only a limited number, by leaders in this line, are shown. Productions of several prominent manufacturers have been given a place in these columns during the past few months, but the collection would be neither representative nor complete if it did not include the styles shown in this number. These comprise a lady's coat of English tweed, in black and white or mixtures.

and a man's coat of double texture material, both water proofed by the "Kentricon" process. [C. Kenyon Co., New York.]

They also comprise the "Swithin" sport coat for men, from the stock of a specialist in this class of apparel. This coat is made of rubberized silk. The open plait in the back affords ease of movement in golf and other sports. [Abercrombie & Fitch Co., New York.]



CHURCH TELEPHONES FOR DEAF WORSHIPPERS.

With the aid of a simple apparatus recently devised the church-goer whose hearing is defective may now listen in comfort to the entire service, no matter where he or she may be seated.

A telephone transmitter consisting of three special microphone transmitter units in an ebony finished case is mounted on the pulpit. The receivers in the pews are of the usual watch-case variety, with a lorgnette handle provided with a special sliding extension to vary

the length from four to seven inches—thus making them so convenient for use that they may be held to the ear for any length of time without fatigue.

A jack connected to the line leading to the transmitter is placed in the pews, and each receiver has a cord and plug. To make the instrument available, the plug is simply inserted in the jack. This telephone apparatus could be used equally well in the theatre or lecture hall. The receiver cap, handle, receiver case and mounting block molded inside of the case are made of hard rubber. [Western Electric Co., New York.]

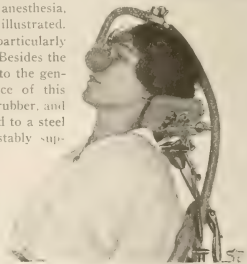


DENTAL AND SURGICAL INHALERS IN NEW FORMS.

The greater success of present-day surgery is due not only to increased knowledge and skill on the part of the surgeon, but also quite largely to improved implements and appliances. Specialization in apparatus of this sort with an aim toward perfection has lately resulted in the introduction of two new inhalers used to produce analgesia or anesthesia, both of which are here illustrated.

The nasal inhaler is particularly suited to dental work. Besides the rubber tubing common to the general type, the nose-piece of this inhaler is made of soft rubber, and rubber pads are attached to a steel head band which adjustably supports the tubing and prevents it from dragging over the head. There are four of these soft rubber pads, two fitting across the forehead, as shown in the picture, and the remaining two forming a hollow in which the back of the head fits.

The soft rubber nose-piece can be adjusted to fit, air-tight, over any nose, and an adjuster strip makes it possible to bring any amount of pressure required against the face or to press back any desired amount of the upper lip, for work on front teeth. The inhaler, while durable, is simple in construction and can easily be taken apart for sterilization.



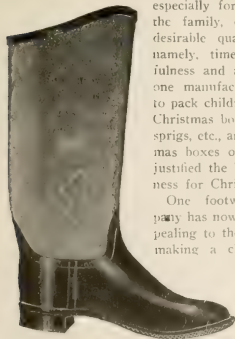
The surgical inhaler is intended for use where prolonged anesthesia is required, where it is desirable that the inhalation of atmospheric air may be controlled by the anesthetist. This inhaler has an air cushion of rubber which completely embraces the nose and mouth and which is made to fit air-tight by inflation. This cushion is attached to a transparent celluloid hood through which the patient's lips may be seen and any necessity for admission of atmospheric air promptly noted. The hood with its rubber cushion is so connected with the valve body that the position of the patient's head may be changed without lifting the mask from the face. [The S. S. White Dental Manufacturing Co., Philadelphia.]



A RED-LEGGED BOOT FOR SANTA CLAUS TRADE.

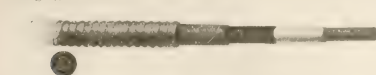
Some active mind in the rubber trade discovered some years ago that rubber boots made particularly good Christmas presents, especially for the younger members of the family, combining four eminently desirable qualities in Christmas gifts, namely, timeliness, usefulness, healthfulness and acceptability. Accordingly, one manufacturer after another began to pack children's rubber boots in fancy Christmas boxes ornamented with holly sprigs, etc., and the sale of these Christmas boxes of rubber boots thoroughly justified the belief of their appropriateness for Christmas-time.

One footwear manufacturing company has now gone a step further in appealing to the Santa Claus trade. It is making a child's boot with a black foot and a red leg of the watered silk pattern. This boot is called the "St. Nick" and, like others especially intended for holiday trade, will be packed in a special Christmas box. [United States Rubber Co., New York.]



A NEW CABLE FOR MOTOR-DRIVEN CONVEYANCES.

A leading cable manufacturer has just brought out a new line of armored cables for motor cars, motor boats and other motor propelled conveyances. The insulation of these cables consists of high grade rubber, varnished cambric and waxed and varnished

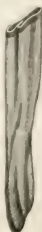
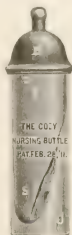


braids. The armor is in the form of a D-shaped brass wire ribbon or a galvanized steel wire wound closely around the cable. Other types have plain rubber insulation without braided coverings. [The Standard Underground Cable Co., Pittsburgh.]

NEW HYGEIA INVENTIONS.

Rubber nipples for babies' nursing bottles constitute quite an item in the annual sales of manufacturers of druggists' sundries, the demand being constant and regular. Hitherto the nipple has been the only part of the bottle to be made of rubber, but here is a new nursing bottle, the "Hygeia Cozy," the food receptacle of which is a collapsible rubber bag. This rubber food receptacle is surrounded and supported by an aluminum jacket—open at the bottom for purposes of ventilation—which also gives support to the breast nipple, another new nursing device brought out by the same manufacturers.

There is a hidden shield in the dome of the breast nipple, about its base, which makes it non-collapsible while freely yielding in all directions. It also has a short neck, which prevents the child from accomplishing what seems to be a baby's chief aim, strangulation while feeding. This nipple and the rubber nursing bag—which can be turned inside out for cleaning—in combination, form an innovation in nursing bottles and leave no excuse for lack of perfect sanitation in the matter of the baby's food supplies. [Hygeia Nursing Bottle Co., Buffalo, New York.]

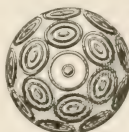


PROTECTING THE CRICKETER'S KNUCKLES.

To be sure, the game of cricket does not enjoy the same vogue in the United States as baseball does, for instance, but still there are a great many cricket players in this country and naturally they want the same sort of equipment that the cricket players of England find indispensable. As a part of this equipment, the batting glove might be mentioned. This is made of white duck with elastic bands attached to the back of the glove and going around the wrist to insure a good fit, and having in addition rubber tubes running along the fingers and over the knuckles at the back of the glove to protect the hand from the occasional impact of the ball; for the cricket ball it must be remembered is a fairly hard commodity and to have it shot against the unprotected knuckles produces a sensation by no means agreeable. This batting glove obviates any such contingency.



Another highly desirable feature in the cricketer's equipment is a bat with an inserted layer of rubber through the entire length of the handle. The handle is split in the middle, a layer of rubber put in, then the whole wound with cord. This insert of rubber serves the excellent purpose of taking the sting out of the blow when the bat strikes the ball too near the handle or too near the end—something that is always liable to occur. [A. G. Spalding & Bros., 520 Fifth Avenue, New York.]



GOLF BALL DESIGN.

The accompanying illustration shows the new design adopted by Flamer Kempshall, famous golf ball manufacturer for use in golf playing balls.

HAIR TONIC COMB.

Those who hope by the application of tonics and restoratives to increase the natural beauty of their hair or to repair the ravages of time or other unavoidable natural conditions; also the aspirants to enhancement of personal charm through a change in the color of their hair, will find a convenient agent in the rubber comb here illustrated.



This is an all-rubber device, the teeth being hollow, so that when inserted into the liquid cup, a pressure of the rubber bulb causes the comb to drink up the liquid, to be later distributed by gentle pressure of the bulb as the comb is drawn over the scalp. [Montgomery, Ward & Co., New York.]

RUBBER BIRD AND GAME CALLS.

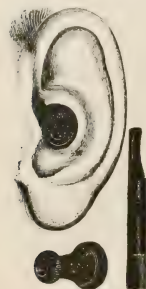
The rubber bird and game call is not a new article of manufacture, but it is certainly one of the most practical articles of its kind, for it is not affected by dampness; and the near approach of the season of its greatest usefulness makes mention of it timely.

The illustration shows a duck call made entirely of hard rubber. It has a sliding device by which the tone can be instantly changed, to imitate different kinds of ducks and to meet varying conditions of weather. It is known as the "O. K." call, retails at one dollar and will give unlimited service [New York Sporting Goods Co., 15-17 Warren street, New York.]



RUBBER SHOCK ABSORBERS FOR THE EARS.

An ear defender is a positive necessity for protection against damage to the ear drums and deafness resulting from excessive air vibrations induced by heavy gun fire, shell explosions, etc. The illustration shows the form of this device furnished by the British government to its army and navy. The body of the defender is made of hard rubber, in a variety of sizes. Near the large end is a series of alternating discs of fine wire gauze, and a diaphragm of gold beaters' membrane. The latter stands free of contact, and is limited to the minutest motion by the gauze on either side of it. This instrument effectually protects the wearer's hearing by excluding violent concussions of air, and at the same time permits him to hear ordinary conversations. An ebonite tool for cleaning the open end of the defender accompanies each pair of instruments securely packed in a pocket case, in which they are held in place by rubber studs. [The Mallock-Armstrong Ear Defender Co., 86 York street, London, England.]



This is a new rubber sole, lighter than leather, of good wearing quality, and is not a perspiration inducer. These soles, three-eighths of an inch thick, are now being worn by policemen, motor-men and others whose occupation requires a heavy-soled shoe that is flexible and comfortable. [The B. & R. Rubber Co., North Brookfield, Massachusetts.]

THE ARMOR-TRED SOLE.

Dentists are using a jar for sterilizing their instruments. The top is fitted with a rubber ring like the ordinary preserve jar ring. [The S. S. White Co., Philadelphia.]

THE INTERCHANGEABLE RUBBER HEEL.

A western shoe manufacturing concern has brought out and is applying to all its shoes a new rubber heel that will help the wearer to walk straight and also to eliminate—or at least moderate—the cobbler's bill, for when he finds himself running down at the outside of the heel he can simply change that heel over



to the other shoe, bringing the worn part to the inside of the foot. The change is easily made and requires only a screwdriver for its mechanical execution.

This heel is made of tire rubber, with a metal insert that receives a similar metal plate nailed to the heel base of the shoe. A screw through these plates, in the center of the heel, holds the heel firmly in place. The heel is made in sizes to fit the various sized shoes, the plate in the heel corresponding in size to the plate in the shoe for which it is made. The line of shoes on which this new rubber heel is being used includes men's heavy work shoes, high boots for hunting, etc., and boys' shoes. [The Trolle Shoe Co., Racine, Wisconsin.]

FOOTBALL PANTS WITH ELASTIC BAND.

Of all athletic sports football is the most strenuous, and a costume facilitating freedom of movement, as well as, affording adequate protection against accident, is a prime necessity for the would-be player. Nose-guards, ear-guards, face-masks, etc., have been described in previous issues of this publication. In the football pants here illustrated a new feature, namely, a broad elastic band—as will be seen in the accompanying illustration—performs the double service of holding the thigh guards in the proper place and allowing greater freedom of movement than was possible with the old-style pants. The garment is made of fine, tan-colored khaki cloth, with a separate lining, to which the felt or padded drill hip pads and felt-lined thigh guards are attached, being easily removed to permit the lining to be washed. [Rawlings Manufacturing Co., St. Louis, Missouri.]



RUBBER COVERED SCREW DRIVER.

The application of soft rubber to the handles of small hand tools should meet with approval, for rubber handles have many advantages. A screw driver with the handle and stem covered with rubber is shown in the illustration and is an excellent example of molded rubber work.

Such a tool is indispensable to the electrician who works around electrical machinery, particularly the low voltage type. It is insulated and therefore proof against the carelessness which in the use of an ordinary screw driver frequently results in short circuits and considerable damage.

The rubber affords an excellent grip and also immunity from blisters. The exposed steel blade measures 3½ inches and the length over all is 11½ inches. [H. D. Smith & Co., Plantsville, Connecticut.]



The Scimatco laboratory tubing is "different from any other rubber tubing on the market." So says the Scientific Materials Co., Pittsburgh.

The Tire Trade.

THE MCGRAW COMPANY OPENS PACIFIC COAST BRANCHES.

At the annual meeting of the stockholders of The McGraw Tire & Rubber Co. held at the company's executive offices, East Palestine, Ohio, October 4, the following officers were re-elected for the ensuing year: E. C. McGraw, president; R. W. McGraw, vice-president; John Morgan, vice-president and treasurer; L. M. Keyes, secretary, all of East Palestine.

It was decided to establish direct factory branches on the Pacific Coast, at San Francisco, Los Angeles, and Portland, Oregon, under the district management of S. L. Warner, and the sales management of C. K. Whittaker, with headquarters at San Francisco. C. H. Connelly, heretofore Buffalo manager, will take charge of the Kansas City branch, while his former assistant, G. J. Marshall, will succeed to the management of the Buffalo store. R. G. Nelson, who has been connected with the McGraw sales department for the past six months, has been appointed superintendent of branches.

The company is adding new buildings of steel and brick to its plant at East Palestine which will give 800,000 square feet of additional floor space. It is also expending \$300,000 for new machinery.

UNITED STATES BICYCLE TIRES.

The United States Tire Co.'s 1916 line of bicycle tires includes 16 different styles of casings, most of which closely resemble in appearance the automobile tires manufactured by the company, such as "Nobby Tread," "Chain Tread," etc.

NEW TIRE FACTORY IN COLORADO.

The Dry Climate Tire Manufacturing Co., which was recently formed in Colorado with a capital of \$200,000, has started manufacturing operations at Arvada, Colorado, about 7 miles from Denver. This new tire manufacturing company expects in a few weeks to be able to produce 100 casings and 350 inner tubes a day. The factory as it now stands cost \$28,000 and \$35,000 of machinery has been installed in it.

BALTIMORE REGULATES USE OF SOLID RUBBER TIRES.

An ordinance of the city of Baltimore, Maryland, requires users of motor trucks equipped with solid tires to take out licenses for the use of these tires. This measure is intended to prevent users of trucks from running their machines with tires so worn and damaged that they injure the pavements.

A NEW NON-SKID TIRE CASING.



The accompanying cut shows a new non-skid tire casing, the feature of which is an exceptionally thick, heavy tread designed to combine the valuable qualities of suction-type treads with those of raised or studded types. Hence the designation "Universal Tread" which the manufacturer, the Michelin Tire Co., Milltown, New Jersey, has given this casing. The extra heavy, broad tread of special design, it is claimed, causes this tire "to stick to the ground" when the car is being started and when the brakes are applied, thus obviating slipping and the resultant friction which wastes substantial quantities of valuable rubber. Superior resiliency, perfect non-skid qualities and greater durability are the principal advantages claimed for this new casing.

"Rubber Machinery," Mr. Pearson's newest book, filled with valuable information for rubber manufacturers, is now ready for mailing. Price, \$6.

CAN BRAZIL BE PERSUADED TO LOWER THE TARIFF ON TIRES?

Early in October the secretary of the Rubber Club sent out a letter to the tire manufacturers calling their attention to the fact that while rubber boots and shoes entered Brazil under a 20 per cent. differential tariff, rubber tires enjoyed no such privilege, and suggesting that they make an appeal through the State Department of Washington to the Brazilian Government to have tires included under the differential tariff clause, in making up the revenue budget for the coming year.

GENERAL NOTES REGARDING TIRE MANUFACTURING COMPANIES.

The Luck Tire & Manufacturing Co., of San Antonio, Texas, is erecting a \$100,000 factory to manufacture the Luck pneumatic puncture-proof tires for automobiles. This tire was invented by John J. Luck, of San Antonio, and its qualities have been tested during the past eighteen months. It is stated that a set of tires has traveled 14,000 miles over some of the roughest roads of Texas.

The Republic Rubber Co., of Youngstown, Ohio, reports very satisfactory service from its solid truck tires. These are manufactured of a stock which resists the tendency to break and crumble by the heat developed under severe conditions of road use.

The Republic Company is marketing a new automobile tire of specially designed cord construction.

The salesmen and office force of the Philadelphia branch of the Goodyear Tire & Rubber Co. held a banquet at the Adelphi Hotel, Philadelphia, on the evening of October 15.

The plant of the Perfection Tire & Rubber Co. in Factory—the new factory addition to Fort Madison, Iowa—is rapidly nearing completion. The output of the factory has been contracted for by an eastern jobbing firm. The officers are: J. H. Christian, president; C. R. Cole, vice-president; D. A. Stickelman, treasurer; and L. A. Rockwell, secretary.

A new rubber plant called the Sebring Tire & Rubber Co. is under way at Sebring, Ohio, a building 60x190 feet with power house separate being in process of construction. The company's officers are as follows: H. D. Weaver, president; C. B. Smith, vice-president; William Stevenson, secretary; Ed. Stanley, treasurer; John Hotchkiss, manager.

The Punctureless Auto Tire Co., recently formed at Akron, has elected the following officers for its first business year: W. R. Price, president; D. A. Messner, vice-president and general manager; S. Arthur Messner, secretary and D. I. Evans, treasurer.

The United States Wheel & Tire Co., which for some time has been operating at Pierre, South Dakota, has been reincorporated in Illinois with a capital of \$300,000, to manufacture automobile wheels, tires and complete motor trucks.

It is reported that the American Tire & Rubber Co., Akron, has a contract to furnish 1,000 tires weekly to the Russian government. The contract was negotiated through the Imperial Russian consul in Toronto, Canada, and it is said that it is for the duration of the war.

The new three-story brick building of the Marathon Tire & Rubber Co. at Cuyahoga Falls, Ohio, is nearing completion.

It is said that the purchase of tires just made by the Keystone Tire & Rubber Co., of 1650 Broadway, New York, is the largest cash tire deal ever made. The company has bought a million dollars' worth of casings from one of the leading manufacturers.

The Southern Tire & Rubber Co., of Augusta, Georgia, is increasing its staff from 50 to 90 employees and doubling its output, which now amounts to about 75 tires per day.

PERSONAL MENTION.

Edward F. Moloney has recently taken charge of sales in the New York territory for the Gihney Tire & Rubber Co., of Philadelphia, as manager of the New York branch. Mr. Moloney was formerly with the Firestone Tire & Rubber Co. as manager of the solid tire department of that company's New York branch.

G. A. Dodge, mechanical engineer of the Mansfield Tire & Rubber Co., Mansfield, Ohio, has recently been elected a member of the Society of Automobile Engineers.

M. H. Parsons, formerly with the Goodyear Tire & Rubber Co., has accepted the position of district sales manager for the McGraw Tire & Rubber Co., of East Palestine, Ohio.

Eino H. Trump, formerly superintendent of The Quality Tire & Rubber Co., of Hartville, Ohio, is now superintendent of the new Sebring Tire & Rubber Co., of Sebring, Ohio, which expects to be making tires by February 1, 1916.

James Couzens recently resigned his position as vice-president and general manager of the Ford Motor Co. and Frank L. Klingensmith has been appointed to succeed him. Edsel B. Ford, son of Henry Ford, succeeds Mr. Klingensmith as secretary of the company.

Mr. G. H. Stonestreet, who for the past three years has been connected with British Goodyear interests, has been appointed manager of the South African branch of the Goodyear Tire & Rubber Co., with headquarters at Capetown. Mr. Stonestreet was formerly connected with The B. F. Goodrich and Continental companies and sailed recently for his new post.

The Knight Tire & Rubber Co., of Canton, Ohio, has appointed H. D. Palmer sales representative in New York State territory, in place of E. J. Coniff, who resigned.

A NEW "TROUBLE-PROOF" TIRE.

A new automobile tire, made by the Leather Tire Goods Co., Niagara Falls, New York, is built with a strip of chrome tanned leather placed inside the casing next to the inner tube and protecting the latter from nails, pieces of glass and similar hard objects that may come through the tread of the tire where most punctures occur. It is also claimed that when the casing is badly worn the leather will prevent it from blowing out.

PERFECTION ASBESTOS FABRIC TIRES.

A new tire, guaranteed to be proof against puncture, blow-out, heat, water and grease, is to be presently placed on the market by a company in Fort Madison, Iowa. The peculiarity of the "Perfection" tire—is it branded—is that a fabric made of woven asbestos takes the place of the usual Sea Island cotton fabric. Its breaker strip is woven from asbestos-covered wire.

TIRE TREAD WEAR.

An item of tread wear not commonly recognized is sliding friction. P. W. Litchfield, of the Goodyear Tire & Rubber Co., defines this as the friction between the tire and the ground due to surface motion of the tread. As the tire surface is doubly curved, flattening it against the ground involves a certain amount of surface distortion. When this distortion is transferred from one part of the tread to another, a continuous sliding friction is produced.

NO WONDER THE TIRES ARE STRONG.

A STORY told by pictures is much more impressive than a story told by words. For instance, the Goodrich company, describing the cable cords which form the body of the Silvertown cord tires, speaks as follows:

"With 144 strands of cotton thread made from long fibered Sea Island Cotton, each one impregnated with rubber which has literally been driven into it, and then cabled together

and again impregnated with rubber, each cord which goes into a Silvertown is capable of standing approximately 250 pounds of strain in tension pull."

That is a good description, brief and intelligible; but one really gets a better idea of the strength of this cord by looking at the accompanying illustration, which shows a stock gentleman, said to weigh 190 pounds and he certainly looks it sustaining his whole weight by a single Silvertown cord.



A SINGLE SILVERTOWN STRAND HOLDS A 190-POUND MAN.

It might be added that in constructing the tires these cords are laid across the tread at an angle of 45 degrees. One layer is placed above the other at an angle of 90 degrees. Two of these layers constitute the carcass of the tire, on top of which are laid a cushion drum, breaker strip, and the tread rubber.

CORD TIRES AT THE ASTOR CUP RACE.

The Astor Cup Race held October 9 at the Sheepshead Bay Motor Speedway, near New York City, was a notable triumph for American built automobiles and American tires. The distance, 350 miles, was covered by the winner in 3 hours 24 minutes 42 seconds—an average speed of 102 miles per hour—and the second car finished within 90 seconds of the winner. Only six cars finished, and out of these six the first five were American machines equipped with Goodrich Silvertown Cord tires. In fact the sixth car at the finish—a French Delage—was also running on "Silvertowns," and averaged better than 84 miles per hour.

In reading these figures few realize the tremendous strain such terrific sustained speeds impose upon rubber tires. But in spite of the terrible grind only ten tires were changed during the entire race. Of these, nine were on right, or outside wheels; the only left tire changed being replaced as a measure of prudence because it appeared dangerously worn. The winning car covered the distance of the race without a single tire being changed.

News of the American Rubber Trade.

ENGLAND DENIES INTERFERENCE WITH AMERICAN TRADE.

SO many charges have been made in influential quarters that Great Britain was seriously interfering with the legitimate trade of the United States with neutral European nations for the benefit of her own exporters that the British government thought the situation warranted a reply, and this was made early in October by Sir Edward Grey in the form of a note handed to Ambassador Page. Sir Edward cites facts and figures to prove that there can have been no interference with American trade to neutral countries in Europe for the simple reason that this trade has, as a whole, largely increased since the beginning of the war. Referring to the rubber situation, he speaks as follows:

Re-exports of rubber from the United Kingdom to Scandinavia and the Netherlands declined from 17,727 centials of 100 pounds in January-May, 1914, to 16,693 centials in January-May, 1915; on the other hand exports of rubber from the United States to the same destinations increased from 1,579 centials to 5,040 centials. Larger re-exports of rubber to the United States from this country have indeed taken place, but all other re-exports of rubber have declined during this period, as the following figures show:

	—Centials of 100 pounds—		Increase in 1915 over 1914.
	Jan.-May, 1914.	Jan.-May, 1915.	
To all destinations	553,864	667,509	+113,645
Of which to United States.....	48,435	118,619	+70,184

*Or 20.5 per cent. †Or 68.6 per cent.

MORE RUBBER TO THE UNITED STATES.

It will therefore be seen that this country has actually been supplying more rubber to the United States at the expense of other neutrals, while American exporters have taken advantage of this to ship increased quantities of rubber to Scandinavia and the Netherlands.

RUBBER BROKERS MAKE A CLAIM ON THE GOVERNMENT.

When the United States Government decided that it must raise more revenue last year, it passed an act requiring the placing of a ten-cent stamp on every contract. The same act, dated October 22, 1914, called for a special tax of twenty dollars for each commercial broker. This added considerably to the expense of doing business. The law required a ten-cent stamp on every contract passed, whether it was for a hundred-ton sale or just a single case of pontianak, on which the broker's commission might amount to only five cents.

But the brokers, of course, are all patriotic men, and they bought the stamps in ten-dollar lots, and stuck them on the contracts as soon as they were closed and forwarded to the importers or sellers. Then the sellers, in turn, sent memoranda of receipt of these contracts to the buyers and slapped on each such acknowledgment, or contract, a similar ten-cents' worth of gummed paper.

This seemed to be double taxation, but it continued until somebody waked up to this fact. Then there came a ruling that the broker was not the responsible party to the transaction, but that all the responsibility for filling such contract rested with the seller, and that the seller, and he only, need place the adhesive tax certification on his contract. The importers immediately notified the brokers, and now the brokers are endeavoring to secure from the government the amounts they have expended under the misunderstanding that they were liable. Many of them had a larger or smaller number of ten-cent stamps on hand. These they turned in to the Revenue offices of their districts, and with them claims for all the stamps they have stuck on their contracts.

These claims are still in abeyance. The brokers have heard nothing from the government, but such matters move slowly, if they move at all, and the brokers hope to get a refund, some day, which will go on the credit side of their profit and loss account.

WHO HAS LOST 800 POUNDS OF RUBBER?

A circular was sent out on October 22 from the office of the secretary of the Rubber Club to crude rubber importers, dealers and brokers, calling their attention to the fact that 800 pounds of crude rubber had recently been bought by the captain of a railroad barge lying at New Brighton, Staten Island, from the captain of a scow, which at the time of purchase was tied to one of the North River piers. As obviously this is a very unusual channel for the distribution of crude rubber supplies, the transaction on the face of it savors of irregularities, and it is highly probable that somebody is short 800 pounds of rubber. Any one who discovers that he is in such a situation can apply to The Rubber Club of America, 17 Battery Place, New York, for further information.

THE NEW YORK ELECTRICAL EXPOSITION OF 1915.

The Electrical Exposition and Motor Show of 1915 was held at the Grand Central Palace, New York, October 6-16. The large attendance attracted by the promise of new and interesting features was amply repaid by the many excellent exhibits.

The great electrical achievement of the year, the bringing of two cities three thousand miles apart within speaking distance of each other, was given a popular demonstration. Each day an average of 1,500 "listened in" on the transcontinental telephone line, and heard a brief account of the day's happenings at the Panama-Pacific Exposition, some music, and the roar of the Pacific Ocean, breaking against the rocks at the entrance to San Francisco harbor.

There were altogether 163 separate exhibits and among those attracting the most attention were the exhibits of the Army, Navy and Treasury Departments of the United States Government, the Treasury Department showing one of its electrical money laundries, washing and ironing paper money presented for that purpose by visitors to the show.

The General Electric Co. departed somewhat from the usual display of miscellaneous material in an attempt to make an exhibit of more educational value—the principal feature being the daylight motion pictures, illustrating the methods employed in the manufacture of various electrical devices.

The Westinghouse Electric & Manufacturing Co. exhibited a complete collection of electrical devices for the home, shop or office. The particular feature was the new Westinghouse electric range, which has an automatic device which allows the housekeeper to put in a meal at any time, set it for the hour at which the dinner is desired, and then leave the rest to the range. At the appointed hour the dinner will be found cooked to the minute.

RUBBER COMPANY DIVIDENDS.

At the annual meeting of the Swinchart Tire & Rubber Co., of Akron, Ohio, held on September 29, the regular quarterly dividend of 1½ per cent. was declared.

On October 7 the board of directors of the United States Rubber Co. declared a quarterly dividend of 2 per cent. on the first preferred stock and a quarterly dividend of 1½ per cent. on the second preferred stock of the company, to stockholders of record October 15, payable October 30.

Directors of the Kelly Springfield Tire Co. have declared a quarterly dividend of 3 per cent. on the common stock, payable November 1 to holders of record October 15. The previous disbursement made was 1½ per cent.

At the annual meeting of the Electric Hose & Rubber Co., Wilmington, Delaware, October 19, a semi-annual dividend of 5 per cent. on the common stock of the company was declared.

J. W. AYLSWORTH.

TO have been intimately associated with Thomas A. Edison for 26 years is in itself a signal distinction; and to have taken out over 60 patents, all marking distinct progress in the development of new and widely useful substances, is certainly an accomplishment of no mean order. Both of these honors belong to J. W. Aylsworth, technical chemical expert, whose laboratory is in East Orange, New Jersey, and who is familiar to the rubber trade as the inventor of synthetic gums and waxes known under the trade names of "Condensite" and "Halowax."

Mr. Aylsworth is a native of Indiana, and graduated from Purdue University in that State. Twenty-six years ago he became connected with Thomas A. Edison in his work in the famous laboratory in West Orange. In his work as a consulting chemist for the great inventor, he has developed and patented many improvements in incandescent lamp filaments, the Edison storage battery, phonograph recording compositions, record molding processes, and in many other products of modern inventive genius. He is recognized among chemists as a man of unusual attainments in that science.

Early in 1906 Mr. Aylsworth became acquainted with the remarkable properties of phenolic condensation products, and immediately recognized their applicability for use in making improved phonograph records. In the spring of 1908 his experiments had advanced to such a state that The Edison Co. decided to undertake the development of disc record manufacture with his phenolic condensation product composition, the "Diamond Disc Record" being the result.

Somewhat later the Condensite Co. of America was formed to develop the manufacture and use of these substances for other industries for which he foresaw their eminent utility. This company has made rapid progress in developing products of marked value to the electrical industry and in the plastic molding art, operating under more than 40 of Mr. Aylsworth's patents relating to "Condensite," and nearly half as many relating to "Halowax."

Mr. Aylsworth still maintains his relations with Mr. Edison, whose chief consulting chemist he now is, and is also actively engaged as the technical director of the Condensite Co. of America.

WILLIAM E. HARDY.

AMONG those who gave heed to that venerable piece of advice heard very frequently a generation ago, "Go West Young Man," was William E. Hardy, recently appointed sales manager of the Boston Belting Co. Later, however, he heard the more modern slogan, "Back East," and concluded that that probably fitted his personal case best—so back East he came.

Mr. Hardy was born in a rubber atmosphere, so to speak, for he first saw the light in Akron, June 5, 1879. His education was

secured in the public schools there, and later he graduated from Buchtel College, an institution which has done its share to make Akron famous.

Although William Hardy's thesis at graduation had for its subject "Rubber Substitutes," his studies specialized more on mining and metallurgy, and on graduating he joined his father, working at mining in the wild southwest, Arizona, Colorado, Nevada and Old Mexico. During the years spent in this industry he had many interesting experiences, but Mr. Hardy is a modest man, rather averse to talk about himself. It is certain, however, that he could tell some good stories of adventure were he so inclined.

Then, turning his face eastward, young Hardy worked for a year for the Brown Hoisting Machine Co. in Cleveland, after which he joined the Diamond Rubber Co. factory forces in Akron. His job was running a belt press in the press room. But not long was he working on that press. He was made a factory inspector, then became assistant sales manager of mechanical goods. This was the record of the first seven years with the Diamond Rubber Co. For many months the management urged him to go to New York and take the supervision of sales in that city, and at last he was prevailed upon to do so. He held that position for a couple of years, leaving this to return to Akron to become sales manager of mechanical goods of The B. F. Goodrich Co., which had absorbed the Diamond company.

Mr. Hardy served these two companies eleven years. When the Boston Belting Co. was looking for the best man in the country to take up the work of Mr. Elson, whose prolonged illness prevented him from carrying the load, the officers decided upon Mr. Hardy as the man, and negotiations were at once opened to secure him, with the result that he is now installed as sales manager, with his office at the Roxbury factory of that company.

Mr. Hardy is a young man of ability and energy, a man of experience, with a record of success. He is married, has two interesting children and will live in Brookline as soon as the railroads deliver his *larves et penates*, long overdue, from Akron. At present he boasts of no club memberships, but acknowledges that he is entitled to wear the square and compass. That he is a man of many friends any one will affirm, after being with him ten minutes, and that he will make a host of new ones in his present position is unquestionable, as is also the prediction that he will prove a conspicuous success in this new and responsible position.

MR. WADE MADE FACTORY MANAGER.

Mr. J. Arthur Wade has been appointed factory manager of the mechanical rubber goods and the general rubber goods departments of the Montreal mill of the Canadian Consolidated Rubber Co., Limited. As this factory makes all of the company's hose, belting, packing, druggists' sundries, molded goods and plumbers' supplies, it is obvious that the new manager will have his hands full. Mr. Wade started in the rubber industry in 1895 with the Revere Rubber Co. Eleven years later he joined the Canadian Consolidated Rubber Co., Limited, of Montreal, and has been with them ever since, excepting two years—1912 and '13—during which he was general superintendent of one of the New England mills.

DR. DAHNE SAILS FOR BRAZIL.

Dr. Eugenio Dahne, whose fine exhibit of Brazilian products at the San Diego Exposition was mentioned in some detail in the September number of this publication, passed through New York October 15 on his way back to Brazil for a short visit. The San Diego Exposition has fully lived up to the expectations of its promoters and Dr. Dahne's Brazilian department has been one of its most attractive features. The Exposition will close until the end of the year, when it will be re-opened on a more extended scale for another six months. Dr. Dahne expects to return to this country in December.

PERSONAL MENTION.

One of the most interesting lists of names published in the New York papers in some time was that which appeared early in October showing the assessments on personal property made by the Tax board. The first two names on that list, as everyone might imagine, were John D. Rockefeller and Andrew Carnegie. The fifth name was James B. Ford, vice-president of the United States Rubber Co.

An International Trade Conference will be held under the auspices of the Foreign Trade Department of the National Association of Manufacturers, December 6 to 8, at the Hotel Astor, New York City. On the general committee of arrangements are M. A. Oudin, manager of the foreign department of the General Electric Co.; Edwin C. Shaw, vice-president of The B. F. Goodrich Co., and George E. Long, vice-president of the Joseph Dixon Crucible Co., Jersey City.

At the annual meeting of Wright & Ditson, dealers in athletic goods, Boston, recently held, W. H. Cook was elected to the position of secretary in place of Temple F. Craigie, deceased.

T. Frank Manville, of H. W. Johns-Manville Co., has been elected president of the Wright Aeroplane Co., recently organized with \$1,000,000 capital to take over and develop the aeroplane patents purchased from Orville Wright.

Chester J. Pike, for many years connected with the sales department of the United States Rubber Co., and more recently interested in advertising—especially in the preparation and placing of advertising relating to rubber footwear—was elected director of the Advertising Agents' Association at their annual meeting held recently in Boston.

Mr. J. B. Linder, who joined the Ajax-Grieb Rubber Co. two years ago, having charge of their New York office, has now been appointed the company's general sales manager.

John H. Kelly, vice-president, and Frank V. Springer, manager of the export department of the Republic Rubber Co., returned recently from a month's visit to Europe in the interest of the company's foreign trade, which has been especially active in truck tires. This was Mr. Springer's third trip to Europe during the present year.

Morton L. Paterson, who has been continuously connected with the footwear business since 1887—largely in the rubber shoe specialty—has recently assumed management of the Converse Rubber Shoe Co.'s business at Chicago.

Charles R. Sargent, formerly manager of the Cleveland branch of Innis, Speiden & Co., importers and commission merchants in chemicals and colors, Chicago, has been put in charge of the company's Chicago branch. He will still retain general supervision of the Cleveland office.

Joseph T. Mahon, of the Henderson Rubber Co., Baltimore, recently visited New York City and northern New Jersey in the interests of his company. He reports an active inquiry for "Rub-Hide," an ingredient manufactured by the Henderson company for the purpose of strengthening and preserving rubber.

William E. Barker, manager of sales of the United States Rubber Co., who sailed for Europe late in September on important business in England and France, embarked for home on October 22 and is expected to arrive in New York about the first of November.

E. H. Sprague, for many years president of the Omaha Rubber Co., Omaha, Nebraska, has resigned from that position and William McAdam, formerly manager of the Interstate Rubber Co., has been elected to succeed him. J. L. Eastman, for many years a salesman for the Interstate Rubber Co., has been elected manager to succeed Mr. McAdam.

E. W. Rutherford, lately superintendent of the Wales-Goodyear rubber shoe factory at Naugatuck, Connecticut, has been appointed assistant to General Footwear Factory Manager Myron H. Clark, of the United States Rubber Co., and Charles R.

Haynes has succeeded Mr. Rutherford as superintendent of the Wales-Goodyear mill.

The annual meeting of the Western Association of Shoe Wholesale, held in Chicago late in September, was attended by George H. Mayo, merchandise manager of branch stores of the United States Rubber Co., and also by Charles A. Coe, the Eastern selling agent of the same company.

MR. WADLEIGH SAILS FOR SINGAPORE AGAIN.

The issue of THE INDIA RUBBER WORLD for January, 1914, contained a brief account of the activities of W. L. Wadleigh, of Boston, in the importation of crude rubber and its distribution to the manufacturers of that city and vicinity. After being engaged for a number of years in the distribution of various grades of rubber from Mexico, he determined to make a visit to Singapore with a view to forming associations there for the distribution of plantation rubber in this country; and in carrying out this project he sailed for Singapore in January of last year, remaining in the East for a number of months, and establishing the Wadleigh Co., Limited, of Singapore.

After a year or more in the United States he has sailed again for Singapore, embarking on October 24 on the steamship "Finland," via London and Marseilles, where he will transfer to a P. & O. steamer for the East. He plans to return to this country next May. Before sailing he announced that The Goodyear Tire & Rubber Co. had arranged with the Wadleigh Co., Limited, of Singapore, to purchase crude rubber for The Goodyear Company in the Far East. The Wadleigh Company will also act as special selling agent for the Goodyear products throughout the Straits Settlements and the Malay Peninsula.

EDISON AND THE ELECTRIC INCANDESCENT LAMP.

EDISON DAY, October 21, commemorated the thirty-sixth anniversary of the invention of the electric incandescent lamp and was celebrated in honor of its inventor, Thomas A. Edison. On December 21, 1879, just two months to a day after Mr. Edison first successfully made a carbon filament glow in a glass bulb from which the air had been exhausted, the news of the great invention was given to the world.

This was before Edison had successfully determined and chosen carbonized bamboo, the only substance used for about ten years, in making filaments for commercial lamps, which was followed by the "squirted" filament employing carbonized cellulose in one form or another. Next the metalized carbon filament was used, then the pressed tungsten filament, and finally the special form of drawn tungsten wire used in modern Edison Mazda lamps.

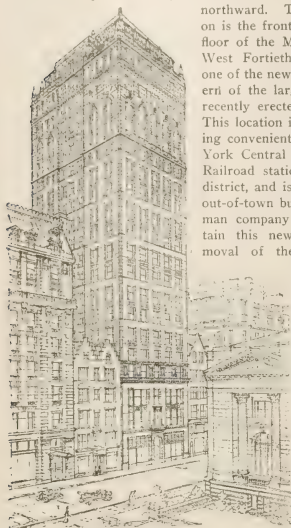
How much the rubber industry owes to Thomas A. Edison becomes instantly evident when we consider how extensively rubber is used in the electrical industry. It enters into almost innumerable forms of insulation for electric wiring, switchboards and general apparatus. As a matter of fact, without rubber it would be impossible to construct the many types of existing electrical apparatus, the many forms of transmission and control of electrical energy that are now in practical operation.



EDISON, 30 YEARS AGO.

THE HODGMAN NEW YORK OFFICE TO MOVE UPTOWN.

The Hodgman Rubber Co., in selecting a location for its new New York City sales office, has followed the march of business northward. The place decided on is the front part of the third floor of the Munsey building, 8 West Fortieth street, which is one of the newest and most modern of the large office buildings recently erected in that section. This location is very central, being convenient both to the New York Central and Pennsylvania Railroad stations and the hotel district, and is easy of access to out-of-town buyers. The Hodgman company intends to maintain this new office—after removal of the main office to



Tuckahoe, New York—as a sales office only, but through direct wire connection with the factory and an auto truck service, deliveries to the New York local trade will be promptly made, and direct freight and express shipments to other parts of the country

will reach their destination without any appreciable loss of time. The removal to these new quarters will be made soon after the first of the new year.

NEW INCORPORATIONS, WITH AUTHORIZED CAPITAL, ETC., 1915.

Armstrong Rubber Co., Inc., The, October 6 (New York), \$200,000. George F. Armstrong, 40 East Newell avenue, Rutherford, New Jersey; Socrates X. Newman, 172 Clay avenue, Rochester, New York; Sadie Mallagh, 60 St. Nicholas avenue, New York City. To manufacture tires and rubber goods of all kinds.

Auto Tire & Equipment Co., The, October 1 (South Carolina), \$5,000. W. K. McDowell, J. H. Young, W. Burgeson, Charleston, South Carolina. To deal in automobile accessories, etc.

Beacon Falls Rubber Shoe Co., September 25 (Massachusetts), \$1,850,000. Louis Bacon, George B. Harris, 111 Devonshire street; Daniel E. Gray, 241 Congress street, Boston, Massachusetts. To manufacture and deal in rubber goods.

Dirigo Rubber & Manufacturing Co., October 1 (Maine), \$200,000. Ernest C. Wallace, president; E. A. Willard, treasurer, and William H. Murray, clerk. Office, 415 Congress street, Portland, Maine. All kinds of manufacture.

Durable Rubber Co., Inc., October 4 (New York), \$4,000. David Auster, 895 East 172d street, Bronx; Moses Redler, 1570 Madison avenue, New York City, and Charles Baron, 9 Warren street, Newark, New Jersey. To manufacture rubber goods.

General Rubber Manufacturing Co., September 29 (Ohio), \$200,000. M. O'Neil, Patience J. O'Neil, P. F. O'Neil and

Lucy A. Mahar. To manufacture and deal in rubber products.

Gregory Rubber Co., The, October 18 (Ohio), \$25,000. Clyde F. Beery, T. M. Gregory, T. M. Gregory, Jr., Leona Gregory, and Winifred Gregory. To manufacture rubber novelties.

Independent Rubber Works, Inc., September 29 (New York), \$1,200. Samuel Gordon, 452 Kosciusko street; Morris Solomon, 2002 Douglas street; Jesse Germansky, 198 New Jersey avenue, Brooklyn, New York. Auto tires.

Marion Tire & Rubber Co., The, October 19 (Ohio), \$250,000. D. M. Mason, M. B. Mason, Robert G. Berlekemp, W. E. Sexton and O. M. Mason. Office, Cleveland, Ohio. To manufacture auto tires and rubber supplies.

New Castle Rubber Co., of Illinois, October 6 (Illinois), \$10,000. Directors: L. W. Hottel, H. M. DeSilva and J. S. Wilson. Office, 2724 Michigan avenue, Chicago, Illinois. To deal in rubber goods.

Pearce-Arrow Tire & Rubber Manufacturing Co., October 1 (Delaware), \$500,000. F. R. Hansell, Philadelphia, Pennsylvania; George H. B. Martin and S. C. Seymour, Camden, New Jersey. Office, Guarantee & Trust Co., Ford Building, Wilmington, Delaware. To manufacture and deal in automobiles and tires.

Peters Company, Inc., October 5 (New York), \$20,000. Henry Trenchard, Jr., Harry E. Trenchard, 252 Ocean Parkway, and Louis J. Peters, 664 10th street, Brooklyn, New York. To manufacture gummed products and materials.

Petters, Inc., O. H., October 6 (New York), \$3,000. John W. Suling, 107 West 111th street; Walter E. Wenzel, 122 Fulton street; Levina Leitch, 226 West 123d street, New York City. Rubber stamps.

Porter Rubber Co., September 13 (Ohio), \$125,000. Joseph C. Porter, A. H. Boyd, W. F. Church, C. F. Smith and L. P. Metzgar. To manufacture and deal in rubber products.

Scott Pneumatic Action Co., Inc., The, October 6 (New York), \$10,000. Ray W. Scott, Harmon, New York; William F. Braun, 16 Sherman place, Jersey City, New Jersey, and George Becker, 934 Jackson avenue, New York City. To manufacture player piano actions, etc.

Sebring Tire & Rubber Co., The, September 15 (Ohio), \$200,000. John Hotchkiss, William F. Smith, C. B. Smith, H. D. Weaver and W. B. Stevenson. To manufacture and deal in mechanical rubber goods, etc.

Self Vulcanizing Rubber Co., September 8 (New Jersey), \$25,000. Albert Keedwell, Dodd street, East Orange; Adrian Tichenor, Raymond street; Josiah Decker, Montclair, New Jersey. To manufacture and deal in self-vulcanizing rubber.

Twin City Cord Tire Co., The, September 16 (Minnesota), \$50,000. Charles A. Ennis, Maurice A. Hessian and C. L. Archer. To manufacture automobile tires.

THE BEACON FALLS COMPANY INCORPORATES IN MASSACHUSETTS.

The Beacon Falls Rubber Shoe Co. took out incorporation papers in Massachusetts, September 25, with an authorized capital stock of \$1,650,000; \$650,000 being 7 per cent. preferred stock, and \$1,000,000 being common stock. The incorporators are Louis Bacon, George B. Harris and Daniel E. Gray. The officers of the company are identical with the officers of the old Beacon Falls Rubber Shoe Co., of Connecticut, viz.: Tracy S. Lewis, president and treasurer; A. H. Dayton, vice-president; R. L. Fisher, assistant treasurer, and Lewis C. Warner, secretary.

A Boston brokerage house has been offering the company's preferred stock at 105 and accrued dividend, at which figure the yield is a little over 6½ per cent.

THE WESTINGHOUSE AIR BRAKE MEETING.

The annual meeting of stockholders of the Westinghouse Air Brake Co. was held at Wilmerding, Pennsylvania, October 21. Condensed statements covering the fiscal year ending July 31, 1915, and a general report by the president, H. H. Westinghouse, were submitted. A dividend of \$2.00 per share was declared, payable October 30 to stockholders of record October 9.

INSULATED WIRE SHIPPED DIRECT TO NORWAY

Evidently some manufacturers of insulated wire have taken the attitude that this product did not come under the interpretation of the term "rubber manufacturers" as used in the guarantee given by American rubber manufacturers to the British Government, under which they agree not to ship rubber goods to neutral countries except by way of London. A shipment of 7 cases and 18 bundles of insulated wire was made by a New York shipping company on the "Bergensfjord," sailing October 16, direct to Norwegian ports. On October 23 the secretary of the Rubber Club sent a circular letter to the insulated wire and cable manufacturers of the country, calling their attention to this shipment, of which he had been notified by the British consul general of New York. The letter concludes with the following paragraph:

"Under the present conditions it is most necessary that all manufacturers of rubber-covered wire goods inform their customers regarding the terms of the British Rubber Guarantee relating to export shipments, and in order to protect their own interests it would seem advisable to have a thorough understanding with firms who have made such export shipments in respect to any further purchases which they may make. The British Government at present is exercising special diligence regarding rubber-covered wire."

A NEW DIRECTORY OF THE RUBBER TRADE

At the rate at which the rubber trade of the United States has grown during the last few years it is inevitable that any directory purporting to give an accurate census of this industry should be soon outgrown. That is what happened to the directory of the rubber trade which was published by THE INDIA RUBBER WORLD in 1906. Inside of five years it was quite inadequate properly to represent the trade. Accordingly, in 1912 this office published a new directory, this time including not only the rubber trade of the United States and Canada, but of the whole world.

This, in turn, no longer adequately covers the rubber field of today. Consequently we are engaged in the preparation of a new rubber trade directory which will appear some time in January next. As it is impossible under present conditions to get any accurate idea of the rubber trade of Europe and as, necessarily, the European situation after the war will differ materially from conditions prior to the war, it was inevitable that Europe should be omitted from this compilation. The new 1916 directory, therefore, will be confined to the rubber trade of the United States and Canada. It will contain a list of the rubber manufacturers of these two countries, arranged under three different classifications. The first arrangement will be alphabetical, irrespective of location. In this list the officers of all the different corporations mentioned will be given. The second arrangement will be geographical, first under an alphabetical arrangement of states and then of the towns in each state. The third arrangement will be an alphabetical one, according to the type of goods manufactured.

In addition, there will be lists of crude rubber importers and brokers, rubber reclaimers, rubber stores and supply men for the rubber trade, including those who sell fabrics, compounding ingredients and rubber machinery.

The department devoted to trade marks and trade names, which has been a valuable feature of the two former directories, will be revised, enlarged and corrected to the present time, and will be even more complete in this book than in either of its predecessors. It will be the greatest directory of the trade yet published.

THE MECHANICAL RUBBER GOODS DIVISION DINNER.

The Mechanical Rubber Goods Division of The Rubber Club of America, Inc., will have a dinner, November 3, at 6:30 p. m. at the Union League Club, New York.

THE ANNUAL MEETING OF THE NEW YORK RUBBER TRADE ASSOCIATION.

The annual meeting of the Rubber Trade Association of New York will be held in the Association's rooms at 82 Beaver street, New York, November 4, at 3 p. m.

WESTINGHOUSE ELECTRIC INCREASES WAGES.

The Westinghouse Electric & Manufacturing Co., of East Pittsburgh, Pennsylvania, has granted its shop employees an average 8-hour and 40-minute day instead of the average 9-hour day, or a 52-hour week instead of a 54-hour week, and they will have the same weekly wage for 52 hours now obtained for 54 hours. A bonus of 6 per cent. on the earned wages is also to be paid in progressive quarterly installments, which will give the employees a yearly increase of about 10 per cent. in wages. The new work hours and bonus payments began October 1.

A savings fund has been established to encourage thrift among the employees, the company acting as trustee and guaranteeing the deposits and 4½ per cent. interest.

MR. AYLSWORTH THE INVENTOR OF CONDENSITE.

To the Editor of THE INDIA RUBBER WORLD:

In your issue of October 1, Dr. L. H. Backeland is mentioned as the inventor of Condensite. This is an error. The inventor is J. W. Aylsworth, who for more than a quarter of a century has been closely associated with Thomas A. Edison, as his chief consulting chemist.

Condensite was developed in the course of a search for a better material to be used in the manufacture of phonograph records, and the Edison Diamond Disc record is the result. Condensite is the only phenolic condensation product that has ever been successfully used in the making of a record, which is probably the most difficult plastic moulded article to manufacture without imperfections.

Condensite is unlike any other phenolic condensation product, because of the unique method by which it is made, and which, of course, is thoroughly described in the Aylsworth patents. By this process the product, during the reaction between the chemicals of which it is composed, is heated to such a degree as to dissociate all the water, a process which if employed in the manufacture of any of the forms of phenolic condensation products described in the art prior to the Aylsworth patents, would render them useless.

This absence of water even in minute quantities, gives to the final product a capacity for taking extremely minute impressions in moulding, as well as imparting to them unusual electrical and other qualities of value.

The next step in the manufacture of Condensite very much resembles that of rubber manufacture. It is compounded with a chemical that reacts upon it when heated, and hardens the product, just as sulphur or other vulcanizing mediums harden rubber when similarly treated, and the process of molding is very much the same as in rubber manufacture.

Your mention of Condensite also refers to it as a substitute for rubber. This is true only in a very small degree; it has in some instances been used in the place of rubber, but its development, so far, has chiefly been in competition with other substances, and with respect to rubber, we should say that Condensite rather supplements than substitutes it. Each possesses valuable properties not found in the other.

CONDENSITE COMPANY OF AMERICA

October 21, 1915.

Kirk Brown, President.

ANNUAL REPORT OF THE INTERCONTINENTAL RUBBER CO.

IN the annual report of the Intercontinental Rubber Co., issued October 4, and covering the year ending July 31, 1915, the secretary states that although conditions in Mexico have not improved during the past year, still it was possible to operate the company's factory at part capacity. The difficulties, however, were great and were much increased by the totally inadequate railway service. Though the prices for rubber prevailing during the year were low, the company's operations show a profit.

The balance sheet, which is reproduced in full below, shows net profits for the last fiscal year of over \$240,000, as compared with a little less than \$51,000 for the preceding year; and the surplus last July was nearly \$200,000 larger than at the same time the year before.

BALANCE SHEET JULY 31, 1915.

ASSETS.			
Investments in stock of merged and subsidiary companies.			
By cash	\$2,315,321.59		
By stock issues	28,198,575.30		
Patents (exclusive of subsidiary companies)		\$30,513,896.89	
Accounts and notes receivable, etc.		15,141.77	
Advances to subsidiary companies.	\$455,194.22		
Sundry accounts	153,292.02		
Investment securities (market value)		608,486.24	
Cash		1,114,493.75	
		230,789.07	
		\$32,491,807.72	
LIABILITIES			
Capital stock, common		\$29,031,000.00	
Accounts payable, taxes accrued, etc.			
Due to subsidiary companies	\$266,258.03		
Sundry accounts	2,806.58		
Reserve accounts		269,064.61	
Surplus (as below)		1,114,493.75	
		2,427,077.39	
		\$32,491,807.72	
SURPLUS ACCOUNT			
Surplus August 1, 1914		\$2,195,840.95	
Gross profit on operations	\$180,140.24		
Net income from securities, interest, etc. (after adjustment of investment securities to current market value)	94,280.90		
	\$274,421.14		
Less administration and general expenses	34,184.70	240,236.44	
		\$2,436,077.39	
Charges against surplus			
Reserve against loans to subsidiary companies	\$9,000.00	9,000.00	
Surplus July 31, 1915		\$2,427,077.39	

H. G. ARMSTRONG JOINS THE MUEHLSTEIN FORCES.

H. Muehlstein & Co., dealers in scrap rubber, whose headquarters are in New York, but who also have offices in Akron and Chicago, have decided, in order to cover the whole field and take in New England, to open a branch office in Boston, and they have selected H. G. Armstrong to take charge of this office and act as their eastern representative. Mr. Armstrong is widely known in the rubber trade, as he has been connected with it for something over 15 years. For ten years he was with the United States Rubber Co. in various important positions, acting at different times as their agent in Baltimore and Chicago, and later being connected with the main selling department in New York; and in these various capacities he made a very extensive circle of acquaintances, both east and west.

The books on business efficiency always devote a few chapters to "The Value of a Pleasing Personality," as if that were something the unfortunate who did not possess it could acquire by reading books. A pleasing personality is a gift of the gods, and is not to be had in any other way. Now, Mr. Armstrong has it, and for that reason the Muehlstein company is fortunate in securing him to represent it in the New England field, particularly as he knows Boston very well, and is very well known in Boston.

TRADE NEWS NOTES.

The Electric Hose & Rubber Co., of Wilmington, Delaware, is extending its plant by the addition of a large one-story warehouse of brick and concrete, 248 feet long and 31 feet wide.

The General Electric Co., Schenectady, New York, has begun the construction of a one-story furnace building, 60 x 178 feet, which will cost \$16,000.

The Allen Machine Co., Erie, Pennsylvania, have reported a recent sale to the Dunlop Tire Co., Limited, Manchester, England, of six 8-inch electrically driven tubing machines. Two were double machines and four were single.

Standard Woven Fabric Co., of Framingham, Massachusetts, which manufactures multiestos products and rubber specialties, has purchased the plant of the Walpole Tire & Rubber Co. at Walpole and will take possession about December 1.

The Second Pan American Scientific Congress will meet in Washington, D. C., from December 27, 1915, to January 8, 1916. John Barrett, director general of the Pan American Union, is secretary general of the congress. There will be special representatives and speakers connected with various educational and scientific bodies throughout the 21 American republics.

The capital stock of the Southwark Foundry & Machine Co., Philadelphia, has been increased from \$500,000 to \$1,300,000.

In an exciting game on the Passaic, New Jersey club field, Saturday, October 9, the New York Belting & Packing Co. won the factory baseball championship, defeating the United Piece Dye Works nine by the score of 4-0.

Oscar Cutler, formerly of Cutler, Spack & Co., scrap rubber dealers, Chelsea, Massachusetts, has dissolved partnership and established new offices at 98 Second street, Chelsea, as Oscar Cutler & Co.

Jacob L. Caplan, formerly of Caplan & Sall, Philadelphia, has dissolved partnership and is now conducting a general waste material business at the same address under the firm name of Jacob L. Caplan Co.

The gross sales of the Converse Rubber Shoe Co. for the nine months ending September 30, amounted to \$974,821, compared with \$806,942 for the same period of 1914. Net profits were \$131,750 this year, compared with \$83,542 last year, a gain of 58 per cent.

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of the shares of rubber manufacturing companies on October 25 last are furnished by John Burnham & Co., 31 Nassau street, New York, and 41 South La Salle street, Chicago:

	Bid.	Asked.
Ajax-Globe Rubber Co., common	300	
Ajax-Globe Rubber Co., preferred	101	
Firestone Tire & Rubber Co., common	800	810
Firestone Tire & Rubber Co., preferred	112	
The B. F. Goodrich Co., common	76	78
The B. F. Goodrich Co., preferred	110	112
Goodyear Tire & Rubber Co., common	333	337
Goodyear Tire & Rubber Co., preferred	109 1/2	110 1/2
Kelly-Springfield Tire Co., common	275	280
Kelly-Springfield Tire Co., 1st preferred	92	92 1/2
Kelly-Springfield Tire Co., 2nd preferred	225	235
Miller Rubber Co., common	240	250
Miller Rubber Co., preferred	109	110
Portage Rubber Co., common	59 1/2	62
Portage Rubber Co., preferred	94	95
Rubber Goods Manufacturing Co., common	91	93
Swinchatt Tire & Rubber Co.	54	56
United States Rubber Co., common	105	107

"Rubber Machinery." Mr. Pearson's newest book, filled with valuable information for rubber manufacturers, is now ready for mailing. Price, \$6.

THE OBITUARY RECORD.

GEORGE F. DAVENPORT.

GEORGE F. DAVENPORT, a salesman in the offices of the Boston Belting Co. for nearly 26 years, died suddenly from heart failure at his home in Ashmont, October 19. Mr. Davenport was born November 22, 1852. He was well-known in the paper industry, as he had sold the products of his company to paper mills located in New England for more than 25 years, and he had many loyal friends. Funeral services were held at his residence, 32 Roslin street, Dorchester, Massachusetts, Thursday, October 21. The interment took place in Belgrade, Maine.

JOHN LOYD.

John Lloyd, head of the machinery manufacturing house of John Lloyd & Co., died at his home in Brooklyn, October 5. He was born in Newton, Massachusetts, in 1835. He entered the United States Navy at the time of the Civil War as an assistant engineer and was assigned to various important duties connected with the Federal men-of-war. He resigned from the navy in 1867, went to New York, and established a general machinery business which was carried on for a number of years under the name of McLaughlin, Grover & Lloyd, but after the death of his partners became John Lloyd & Co. He was one of the first, if not the very first, of the machine manufacturers in the United States to build elastic band cutters for rubber mills. He also constructed various other special machines for use in rubber manufacture.

WARREN M. HILL.

Warren M. Hill, treasurer of the National Tack Co., and at one time identified with rubber manufacture, died suddenly of heart disease at his home in Boston, October 26, in his 53d year. While for many years past Mr. Hill had been associated with the Tack company and with banking interests in Boston, and had not been identified with rubber interests, 25 years ago he was president of the Standard Rubber Co., of Brockton, Massachusetts. In 1892 this company changed its name to the Standard Rubber Corporation, and in 1905 the plant was bought by a leather manufacturer and went out of existence as a rubber factory.

RUBBER TRADE INQUIRIES

- [126.] A subscriber wishes to know the name and address of a maker of porcelain forms for dipped goods.
- [127.] An inquiry has been received for the name of a manufacturer of dipping machines.
- [128.] A company desires to purchase a second-hand rubber mixing mill with rolls from 24 to 36 inches in length.
- [129.] An inquirer wishes to know if there is a machine made for imprinting a trade mark on each yard of rubberized sheeting, along the selvage.
- [130.] A Panama shipper desires to secure an automatic appliance for severing blocks of balata.
- [131.] A London firm would like to correspond with manufacturers of toys and games.
- [132.] A Western correspondent desires names of manufacturers of dental gum.
- [133.] The name of a manufacturer of imported woolen fabrics for rubberizing is requested.
- [134.] An inquiry has been received for manufacturers of Egyptian cotton cloth fabric for use in filter presses.
- [135.] A merchant in England is desirous of obtaining white canvas boots and shoes with rubber soles, from half a dollar up.
- [136.] A foreign correspondent would like to correspond with a manufacturer of benzol.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS

A commission agent in the United Kingdom desires to represent manufacturers of dress shields and other miscellaneous articles. Report No. 18,631.

An American consular officer in Brazil reports that a man is in the market for chloride of sulphur, sulphide of carbon, benzine, lithopone and pentasulphide of antimony. Report No. 18,638.

A firm in Sweden wishes to purchase about 200 pounds of black tubing, 30 pounds of red tubing, air cushions, hot water bottles and other surgical supplies. Report No. 18,674.

A man in Italy wishes to represent a firm manufacturing hard rubber articles, such as syringes, thermometers, atomizers and rubber bulbs. Report No. 18,691.

A company in India wishes to be placed in communication with American manufacturers and exporters of rubber surgical and medical goods. Report No. 18,704.

A firm in Argentina desires to receive catalogs, samples, etc., of American-made cloth for raincoats, bathing suits and caps, and rubber tubes. Report No. 18,715.

A firm in India desires catalogs, price lists, etc., of rubber tires for horse carriages. Report No. 18,722.

A general agent in the Netherlands wishes to secure the sole agency for American manufacturers of elastic goods. Report No. 18,759.

A business firm in Argentina desires to secure the agency for American manufacturers of automobile tires and accessories. Report No. 18,768.

A Swiss firm would like to establish business relations with American manufacturers of rubber bands for use in making tin cans air-tight. Report No. 18,781.

A man in Greece desires quotations on insulated switchboard cable for telephone apparatus and single insulated wire. Report No. 18,807.

A man in Denmark wishes to purchase American-made oil-cloth, rubber shoes and waterproof clothing. Report No. 18,836.

A trading corporation in the Netherlands, selling goods in the Dutch East Indies, desires to communicate with American manufacturers of rubber and other goods. Report No. 18,845.

A Russian manufacturer desires to establish business relations with American manufacturers or exporters of material and equipment required for the manufacture of rubber stamps and engraving work. Report No. 18,855.

IN THE MARKET FOR FIRE HOSE.

The fire commissioners of San Jose, California, will purchase 3,000 feet of 2½-inch hose and 2,000 feet of 1½-inch hose, to be delivered December 1.

The Good Will Fire Co., of New Castle, Delaware, is asking for samples and prices on 300 feet of hose.

The Union Fire District of South Kingstown, Rhode Island, has voted to purchase a motor combination chemical and hose wagon, equipped with 3,500 feet of chemical hose and 1,000 feet of regulation hose.

PROPOSED GOVERNMENT PURCHASES

The Bureau of Supplies and Accounts, Washington, is inviting bids, to be opened November 9, on Navy Department supplies as follows: 7,200 feet rubber fire hose, 45 feet suction hose—schedule No. 8887; 4,000 feet rubber air hose—schedule No. 8911; 2,000 feet rubber wash deck hose—schedule No. 8918; 335 pounds hard rubber, in sheets—schedule No. 8925. To be opened November 23; 1,500 rubber packings—schedule No. 8943. To be opened November 30: sheet rubber, cloth and insertion wire packing—schedule No. 8941.

Replete with information for rubber manufacturers.—Mr Pearson's "Crude Rubber and Compounding Ingredients."

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

IN several branches of the rubber business there is increased activity, which in part makes up for the quiet times of last season and the early fall. The clothing trade is booming, and the manufacturers of the standard and finer lines are so rushed with orders that extra hours or larger forces are necessary. The makers of coated fabrics are running their factories double time. The footwear trade was busy during September, but tapered off during October, and at present writing manufacturers and wholesalers are waiting for the rush which must inevitably come when the first heavy storm of late fall arrives.

Garden hose business is flat. There have been but small sales at retail, as the entire summer was a wet one. Retailers did not send in any repeat orders, and have carried over sufficient stocks to warrant a refusal to order any goods for spring delivery. In fire hose, specifications have been drawn so fine and competition is so fierce that this trade is unsatisfactory. The rubber belting business is in a hopeful mood, for leather belting has so increased in cost as to almost prohibit its use. Manufacturers of leather belting are now obliged to pay 75 cents a pound, more than double its normal cost. Were it not for the various rope drives and other power-transferring mediums, rubber belting should have a boom, and perhaps it may, later.

There are somewhat conflicting reports of the tire business. Naturally business falls off at this season, for many who motor in summer store their cars along about this time, and buy no more tires till spring. But if the retail business is falling off, wholesale trade in some factories is encouraging, for some good future delivery contracts are reported closed, which will keep certain mills busy for a large part of the time between now and early spring. A growing branch of rubber manufacture is that of rubber soles for shoes, and those factories engaged in this line. Druggists' sundries are in moderate call.

The demands on its factory space have necessitated the addition of another building to the plant of the Apsley Rubber Co., at Hudson. This will be a brick structure, four stories high, 40 feet wide and 120 feet long. It will be used, on completion, for storage purposes, thus allowing additional machinery to be installed in the main factory and thereby enlarging its regular output. The company completed its new heater building in September, and will make some other important changes, in order to keep pace with the increased demand for its clothing and footwear.

An interview with Mr. Apsley lays at rest some rather persistent rumors that he intended to sell out, this being most positively denied. He says that the company is doing the largest business in its history, each week showing a larger force and an increased pay-roll. Mr. Apsley is just as active and ambitious as when he started his little factory in Hudson over thirty years ago, and to talk with him one is inclined to believe he will continue a prominent factor in the rubber trade for another thirty years.

The factory erected for the Patterson Rubber Co. at Lowell, which was put up at auction some months ago, and bought in by Francis H. Appleton of this city to secure his claim against the Patterson company, has been sold to Ralph B. Phillips, manager of the American Steam Gauge Co., who has formed the R. B. Phillips Manufacturing Co., and is manufacturing shells there on a contract for the British Government.

Press statements to the effect that the Plymouth Rubber Co. sold 500,000 yards of rubberized blankets to one of the allied governments and was considering doubling the capacity of their plant to fill a new order for 3,000,000 yards, have been emphatically denied by Mr. Stone, treasurer of the company. The plant

is running day and night, but entirely on domestic business. To quote Mr. Stone: "The company believes in supplying its own customers first, regardless of attractive prices quoted on temporary business."

Creditors of the Walpole Tire & Rubber Co., of Walpole, have been allowed a seventh dividend amounting to 35 per cent. by decision of Judge Dodge in the United States district court. This brings the total dividend disbursements to 85 per cent.

The Goodyear Tire & Rubber Co. has had on exhibition in its window at the Boston branch some very attractive displays the last month. First was displayed a miniature representation of a South American jungle, showing the rubber trees being tapped, and the latex coagulated and smoked, little dolls well simulating Indians being shown. There were also specimens of the different varieties of crude rubber, each properly labeled. There was also a portrait of Charles Goodyear. The exhibit was visited by a number of delegations of school children and their teachers, who felt the educational importance of such an exhibit.

Last week's display was based upon the premise, "If Charles Goodyear could return," and shows how important has grown the industry based upon Goodyear's discovery. The window was filled with articles made in the Goodyear factory in Akron, appropriately labeled, among them many varieties of tires for automobiles, motorcycles, bicycles, trucks and carriages; also a large line of hose, belting, packing and mechanical goods. The jungle scene was still retained, and made a fitting background for this display.

At the Suffrage parade in this city, October 16, toy balloons were much in evidence—the Suffragists and "anties" both using these attractive toys to display the colors of their party.

Hon. L. D. Apsley, of the Apsley Rubber Co., Hudson, gave an interesting talk at the monthly meeting and dinner of the New England Shoe Wholesalers' Association on October 13.

A. L. Belcher, who for several years has represented the Revere Rubber Co. in Europe, with offices in London, was in this city several days last month, devoting most of his time to consultation with the officers of the company, inspecting the factory and planning for future business. He has sole charge of the mechanical goods sales across the water, which under his able management have grown steadily during the last ten or a dozen years.

George F. Davenport, whose death on October 19 is mentioned on the obituary page of this issue, was a member of the family of that name prominent in Roxbury. Previous to his connection with the Boston Belting Co. he was a salesman for Samuel Kidder, the mill supply house of Boston. He went to the Boston Belting Co. twenty-six years ago, and at once specialized in paper-mill supplies, building up an extensive trade. He was a man of genial qualities, loyal to his house, popular with his customers, combining a keen trade insight and strict integrity with unbounded good-fellowship.

Chester J. Pike, Jr., of the United States Rubber Co., of New England, is the subject of considerable chaffing by his fellow-workers. He made somewhat elaborate preparations for his hunting trip in the wilds of Maine, and his total was one partridge and one hedgehog.

James E. Odell, the popular Boston rubber broker, takes his vacation in sections, a few days at a time. His custom is to tour some attractive route in his automobile, his longest trip being one of six days through the White Mountain region of New Hampshire.

Robert C. Harlow, of Plymouth, president of the Monaquot Rubber Co., of South Braintree, went to Richmond with the Ancient and Honorable Artillery on the occasion of its recent visit to that city.

Harry Arnold, assistant superintendent of the Converse Rubber Co., Malden, started a few days ago on his annual hunting trip to the Rangeley Lake region, with a full camping outfit, and all the ammunition necessary to deplete the forests of game.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

THE Essex Rubber Co. inaugurated this week one of the broadest and most liberal policies in the interest of its employees that have ever been adopted by a manufacturing plant, in this section of the country, at least. It is a plan under which the company will pay every employee to go to night school and improve himself or herself by acquiring a better education.

Some companies have gone to considerable expense to encourage their employees to acquire education in special lines which would fit them to be better workmen in the particular vocation they chanced to be following. The Essex company plan, however, does not limit the list of studies. Many of the young women employees are, for instance, learning dressmaking. Many of the young men are selecting branches totally distinct from the rubber business. Certainly no selfish motive can be imputed to the company, since it is willing to help educate a youth to become a technical man in an altogether different line of business.

Each employee taking advantage of the company's liberality will find in his pay envelope each month a sum of money to be known as "the educational premium." This sum of money will equal the hourly wage earned by the employee for half the time spent by him at any evening class or classes. For the proper carrying out of the plan the company has arranged with the Board of Education, the School of Industrial Arts, the Y. M. C. A. evening schools and the Y. W. C. A. evening classes. Some of the classes are especially for those who cannot talk English. A number of foreigners employed at the plant are taking advantage of this unusual opportunity to learn more about the ways of the land of their adoption. This feature alone, particularly at this time, when so much stress is being placed upon this question, has brought forth hearty commendation from officials of all ranks. Leading teachers and others interested in educational work are closely watching the progress of the plan and without exception they are highly enthusiastic over it.

Several Trenton factories have experienced labor trouble in the unskilled branches of late. Two rubber concerns are among the number. They are the Globe Rubber Co. and the Essex Rubber Co. At these plants the places of the disgruntled men have been taken by other workmen, and in the trimming department at the Essex plant, where some of the girls left their work, their places were satisfactorily though temporarily filled by the wives of the company officials and factory foremen.

* * *

Peter Chevalier, of France, has returned home after spending several weeks in the plant of the John E. Thropp's Sons Co., where he studied the mechanism of the tire-making machines produced by the company. Mr. Chevalier will act as the French agent of the Thropp company, and several tire-making machines have already been sent to France. They will replace the machines of German make heretofore used in the French shops, the American machine doing quicker and better work and requiring fewer hands to operate it.

Jacob L. Newman, of Newark, has been appointed receiver

for Leon Jaffress, a motor tire dealer of Plainfield, with offices also at Harrison, New York City, Detroit and Cleveland.

At the Trenton Fair held recently the exhibit of orchids made by Charles E. Roebing, president of the John A. Roebing's Sons Co., was one of the finest ever seen at an exposition. Mr. Roebing is one of the leading amateur orchid collectors in this country.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE various rubber factories throughout the State are reported to be working to their full capacity, and it is expected that they will continue to operate under similar conditions for an indefinite period. Never in the history of the rubber industry of Rhode Island has there been such a general activity, or such encouraging prospects. Rubber goods necessary to the surgeons of the armies in Europe are in increasing demand and immense quantities are being continually shipped. The factories that are working on automobile tires are rushed to fill their orders, while the boot and shoe factories are turning out unusually large quantities of footwear.

The plant of the Revere Rubber Co., on Valley street, this city, is at present being operated three evenings a week, and the indications are that night, as well as steady day work, will be the order for some time to come. The company is erecting a one-story brick and concrete building as an addition to its facilities, which will be used for storage purposes. It has recently completed a new one-story reinforced concrete laboratory building, which will take rank with anything of its kind in this section of the country, both in its appointments and equipment. It is 41 x 104 feet, with brick tunnels and tile partitions, built to carry two more stories, whenever necessity demands. The building includes three office rooms, a cold storage room, physical testing room, mill room, vulcanizer and press room, and a chemical laboratory.

* * *

In planning for the new storehouse for the National India Rubber Co. at Bristol, the location selected is said to be the best that could be obtained for facilities in handling the manufactured goods of the corporation. A spur-track runs from the New York, New Haven & Hartford Railroad yards to the new storehouse so that freight cars can be taken into or beside the storehouse, which adjoins the railroad yards.

Extensive repairs have just been completed at the pumping station of the National India Rubber Co. and at the DeWolf Inn, which is used by the National company for the housing of nearly 200 of its female employees.

The National company pays the largest tax of any corporation or manufacturing company in the town of Bristol, where its plant is located. The amount this year is \$8,025 on an assessed valuation of \$585,750.

The wire department of the National company is increasing its product, and running overtime to keep pace with the orders.

A full force of help is now engaged steadily at the National mills, where over 2,800 people are employed, with promise of full time for an indefinite period.

The Tubular Woven Fabric Co., of Pawtucket, is rushed with orders for fall and winter shipment, and several of its departments are working three nights a week until 9 o'clock to turn out the requisite amount of work. The company is making a new water and oil-proof hose, which is designed for use on automobiles, and it is reported to have closed contracts with several of the largest automobile manufacturers in the country for early shipments of considerable magnitude.

The Narragansett Rubber Co., located on Wood street, Bristol, has recently made numerous alterations at the plant to secure additional room and to facilitate operations, and a considerable

addition is being constructed for storage and other purposes. There is a possibility that in the spring several new buildings will be erected, with material additions to the present structures. Since the reorganization of the concern there has been a steadily increasing business.

Stockholders, creditors and others interested in the settlement of the affairs of the suspended Atlantic National Bank of this city were greatly pleased with the announcement early in the month that Judge Dodge, in the United States District Court, had allowed a seventh dividend amounting to 35 per cent. to all the creditors of the Walpole Tire and Rubber Co. This brings the total disbursements to date to 85 per cent. of the claims. The Atlantic National Bank was one of the largest creditors of the Walpole company and its suspension was a material factor in forcing the Walpole company into financial difficulties.

The McNaul Tire Co. has removed from 344 Weybosset street to the new Franklin building, 50 Franklin street.

The calendaring department of the International Rubber Co.'s plant at West Barrington is being operated night and day, while other departments are being run on an overtime schedule.

Considerable attention has recently been attracted by the arrival of four cases of imported statuary for the estate of Colonel Samuel P. Colt, president of the United States Rubber Co., at Bristol, which were received through the local custom house. They were modeled by the master hand of Rodin and were purchased in Paris several months ago by Colonel Colt, and the four pieces are said to have cost about \$50,000. One of them, it is said, has long been sought by the Metropolitan Museum of Art in New York.

The pieces of statuary, as named by the sculptor, are "Le Lion Douloureux," "Eve," "Psyche" and "L'Epervier et la Colombe." The purchase of the statue of "Eve" was consummated some time ago, but Colonel Colt also desired to obtain possession of the

Beatty will be assistant to Manager L. C. Rockhill of the auto tire department and will have a much broader field. The change was announced on the return of Mr. Beatty from the recent big conference of branch managers and representatives at the home office at Akron. Mr. Beatty will be succeeded here by Edward J. Smith, who comes to Providence from the Hartford, Connecticut, branch, where he has been for the last three and a half years.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

BANKERS in close touch with the manufacturing interests in Akron predict general prosperity and an unusually successful year for the rubber factories—the customary "slack season" early in the fall and winter now proving a mythical term. Large additions to the Goodrich, Firestone, Kelly-Springfield, Miller and Goodyear plants are being built, and it is confidently expected that all of these factories will run at full capacity throughout the winter, with additional workers totaling 2,000.

Rubber stocks are active; the possibility of a 4 or 5 per cent. dividend on Goodrich in January and of 1916 dividends on Firestone common stock of 20 per cent. being favorable influences in the trading. It might be added that the Goodrich officials give no intimation as to what action they may take.

Akron rubber factories are supporting a bill which has been introduced in Congress to allow manufacturers to establish retail prices below which dealers could not sell. Rubber plants claim that price-cutting is unfair competition and only used as a bait to attract the public to the purchase of other articles at higher prices, and they have petitioned dealers in their products to urge congressmen from their districts to vote for the bill.

The annual sales convention of the Firestone Tire & Rubber Co., ending September 30, was the most successful convention ever held by the company, the attendance being



FIRESTONE SALES CONVENTION,

three other marbles, but was unable to do so because of the sculptor's attachment for them.

Rodin desired to keep the statues himself, as he intended to add them to his own private collection in Paris. It was only after the Germans made their drive upon the French capital that he became fearful for the fate of his creations, and finally acquiesced in Colonel Colt's wish to purchase them.

Samuel M. Beatty, for the past two years manager of the local branch of the Goodyear Tire & Rubber Co., has been promoted to factory representative in the sales promotion department, with headquarters at the factory at Akron. In his new position Mr.

larger and the interest greater, with results correspondingly valuable. There was a total attendance of 500 men, every state in the Union and six foreign countries being represented.

For three days branch managers and salesmen from the many branches of this organization broadened their knowledge of business conditions in general and the tire business in particular by attendance at conferences where the theoretical side of the business was fully and ably discussed by company executives, branch managers and salesmen; the subjects including carriage, motorcycle, bicycle, motor and pneumatic tires; accessories, rims, exports, adjustments, credits, advertising and factory and branch efficiency. Each

man also studied the detailed construction and manufacture of Firestone tires in the factory itself.

An inspiring sight was the home plant in Akron, with five large additions in process of construction. Seven acres of additional floor space will be provided by these enlargements, allowing for an output of 12,000 pneumatic tires per day.

Dinners and outings at the lakes around Akron, and theater parties and banquets at the local hotels, brought the men together socially.

Plans have been approved for a new Firestone employees' club building, four stories high, with a basement, which will cost \$85,000.

The B. F. Goodrich Co. has inaugurated a plan of insurance for its employees, beginning November 1, which includes an old age pension, compensation for the sick and those injured in service, and a life insurance policy ranging from \$500 to \$1,000, according to the time the employee has been working for the company.

The plan of providing these safeguards evolved from a system of physical examinations begun in 1914. The statistics gathered showed physical deficiency in the majority of workers. The sensible and beneficent conclusion upon these results was stated by E. C. Shaw, second vice-president of the Goodrich company, as follows:

"The corporation believes it to be a part of its business to protect, as far as possible, the well-being of all who have contributed to its success and it holds it to be essential to that success that every employee be able to enter upon his or her daily task in fit condition, with mind untroubled by unnecessary worry."

The Goodrich company is to have two more five-story factory buildings, one 100 x 300 feet in dimensions and the other 100 x 260 feet; both costing approximately \$400,000.

The Kelly-Springfield Tire Co. has purchased the plant of the Cataract Rubber Co. at Wooster, Ohio, with the

C. O. Baughman, secretary; R. A. May, treasurer. The regular quarterly dividend of 1½ per cent. was declared, and a probable increase of the rate early in 1916 to 7 per cent. was discussed.

The capital stock is \$800,000. The buildings, real estate and machinery are placed at \$369,000. There is a surplus of \$195,000. A large three-story addition to the factory of the company has just been completed and the erection of another addition 60 x 100 feet has been begun.

The Western Tire & Rubber Co., of Kansas City, Missouri, has purchased 12 acres in Akron, on which is being erected a building of sufficient size to accommodate its constantly increasing accessory business and to provide space for the manufacture of casings and tubes. The building will be finished November 15, and it is expected that the factory will be in full operation by December 1.

The company will be reincorporated under the laws of Ohio, with a different name, with a paid-up capital of \$200,000.

The welfare department of the Goodyear Tire & Rubber Co. has applications for 100 new homes in the community on Goodyear Heights, and hopes within a year to have 2,000 people living in that district. A new quarter-mile running track has recently been completed for the public playgrounds of the community.

The Goodyear "safety first" committee has begun a campaign to prevent accidents in the plant caused by the carelessness and over-confidence of new employees, who attempt to hurry their work to keep pace with the more experienced. "Don't try to compete with your 'buddy,'" is the slogan of the campaign. "Take your time until you have learned the job."

An addition to the plant of the Atlantic Foundry Co. in East Akron is being completed, which will double its capacity and output.



TAKE AT THE FIRESTONE FACTORY.

object of immediately increasing its output to handle the rapid development of business.

The Miller Rubber Co. will soon build a new garage and salvage house, and a press room, both buildings to be one story high, with basement. The estimated cost—\$6,000 and \$4,000, respectively—is low, as the company will be its own contractor.

At the annual meeting of the Swinehart Tire & Rubber Co. on September 29 the following officers were re-elected: Thomas F. Walsh, president; E. L. Mather, vice-president;

The old M. & M. Rubber Manufacturing Company has been reorganized and incorporated under the name of The Giant Tire & Rubber Co., with a capital of \$50,000. Claude E. Hart, president of the M. & M. company, and J. F. Schaefer, secretary and treasurer, will retain their offices in the new organization, which will begin operations about the middle of November in a remodeled building on North Howard street.

The Lincoln Rubber Co. has purchased the abandoned plant of the Summit Rubber Co., of Barberton, which will be operated as a branch of the Lincoln company's Akron factory.

On October 25 about 1,500 machinists employed by Akron rubber companies and allied industries, were notified that their wages would be increased 15 per cent. The increase is made voluntarily by employers.

The bowling league of The B. F. Goodrich Co. is in full swing for the season, with H. W. Hicks as president; Victor A. Parker, vice-president; J. G. Evans, treasurer, and L. B. Kennedy, secretary.

F. A. Seiberling, president of the Goodyear Tire & Rubber Co., has given the new Akron field artillery battery an armory site in East Akron, including a large tract for the armory, parade and maneuver grounds.

Mr. Seiberling was Akron's representative at the recent directors' meeting of the national chamber of commerce at Cleveland.

SOME RUBBER NOTES FROM CHICAGO.

By Our Regular Correspondent.

GENERAL conditions in the rubber trade of Chicago appear to have improved during the past few weeks, according to the leading men in the business here. Mechanical rubber men without exception declare themselves well satisfied with the volume of orders now being received. The heavy grain harvest in the west resulted in numerous rush orders for belting, and many elevator proprietors, who a few weeks ago were resisting the efforts of salesmen to sell them needed belting, have been writing urgent letters for goods. However, the local houses know the country elevator trade well, and were prepared to make prompt shipments on orders after the regular season, so that little distress was caused. The rubber clothing people are having a better fall than last year, owing to the fact that the wet weather started earlier this year. Indeed, they are closing a remarkable summer, during which many houses did a volume of business larger than they ever thought possible. Rubber specialty houses report a good trade, and while the holiday rush is not yet apparent, sales to drug stores and the retail trade in general are quite satisfactory.

Rubber men who are members of the Illinois Manufacturers' Association are much interested in the fight which is being made by that organization on certain features of the factory inspection laws, on the ground that they are worthless, as far as giving protection to the employees is concerned. A dinner was held last week at the Hotel La Salle at which a number of prominent manufacturers in different lines were present. A plan for correcting the objectionable features was outlined. It is claimed that some manufacturers have been forced to spend as much as \$100,000 for improvements which have not done the workmen a particle of good. The manufacturers have a suspicion that certain corporations are prospering at their expense, owing to what is alleged to be inspired factory legislation.

Great enthusiasm witnessed the departure early in the month of the western representatives of the Firestone Tire & Rubber Co. for Akron for the purpose of attending the annual convention of the company in that city. A special train was required. Only a few years ago thirty men were all that could be mustered on a similar occasion. This year at least three hundred were on hand.

The Peck Wheel Co., 4058 Princeton avenue, has been missing rubber automobile tires for some time, and it has become apparent that the firm is one of those marked by the organized band of tire thieves who have been preying on local supply houses and freight yards for a number of months. Recently several members of the band were stopped by officers as they were leav-

ing the Peck company premises with a wagon load of tires. The men leaped from the wagon and escaped amid a volley of shots.

The Central Rubber & Tire Co. is the name of a new firm which has just taken out incorporation papers at the office of the state auditor. The company is incorporated for \$150,000. The incorporators are: Clinton S. Bailey, W. J. Carter and Israel S. Berkman. The firm will make headquarters in this city.

PACIFIC COAST NOTES.

C. A. Ellison and A. H. Skinner, Jr., have formed a partnership and opened a store in Tacoma for the sale of Knight tires. Both men are well known in Tacoma business circles. Mr. Ellison was with the United States Rubber Co. for eleven years, both in the sales division and in looking after tire stocks, covering the Northwest as traveling salesman out of Tacoma and Portland. Mr. Skinner was recently connected with the Pacific Auto Supply Co., Inc., of Seattle, in which he still retains a financial interest.

The Stowe Rubber Co., of Los Angeles, filed a certificate of incorporation under the laws of California on September 24, with a capital stock of \$20,000. The Company will deal in automobile supplies and accessories; all kinds of rubber and fabric goods, etc. The directors are: William J. Stowe, Ada F. Stowe, and Perry W. Stowe—all of Los Angeles.

The Savage Tire Co. has recently opened a branch store in Los Angeles which, in common with all the other branches of the company, is supplied with well-equipped service cars which care for the tire troubles of all motorists, whether users of Savage tires or not, within the city limits of the cities where branches are located. Savage factory distributors, located in all the principal traffic centers, give a like service.

A remarkable record for the United States Tire Co.'s tires was brought to the attention of Manager Wilkinson, of the Los Angeles branch, in the travels of Harold L. Arnold's car, which has been used in scientific work. The first trip was across Death Valley and over the mesa of Western Nevada to Rhyolite in search of ore. No tire trouble was experienced on this trip of more than 2,000 miles across the sands, gravel washes and great ridges which cut out tires quicker than any other sort of road. The car traveled 9,000 miles on one set of United States tires.

RUBBER EXHIBITS AT THE SAN FRANCISCO EXPOSITION.

Though the distance between the rubber manufacturing centers of the east and San Francisco is too considerable to expect a large display at the San Francisco Fair of the products of eastern manufacturers, at the same time rubber is by no means absent from the list of attractions at this exposition. These rubber displays are for the most part made by western companies located near San Francisco.

One of the most interesting displays in the Manufacturers' Building is that of the Bowers Rubber Works of San Francisco. This firm gives a complete demonstration of the manufacture of garden hose. Para and Ceylon rubber is shown in the bulk, and near at hand are workmen operating a loom for the purpose of weaving fabric for the rubber-lined hose turned out by that company. It is of interest to know that a record was made during the summer by the firm, when 32,000 feet of this hose was turned out without a single defect.

The Gold Medal Waterproofing Co., manufacturers of waterproof clothing of Oakland, California, has a fine display in the same building, which gives something of an idea of what is being done in the rubber clothing field by the western manufacturers.

"Rubber Machinery," Mr. Pearson's newest book, filled with valuable information for rubber manufacturers, is now ready for mailing. Price, \$6.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

THE outstanding topic for discussion in trade circles at the moment is the Budget, especially the items of war profits tax. Another tentative feature of the Budget which excited a great deal of discussion was the proposal to put a tax on imported motor cars, motorcycles and tires of 33½ per cent. To be sure, this idea has now been definitely abandoned, but it was not only suggested but for a brief time actually put in force, the basic idea evidently being that it was not only desirable to add to the revenue of the government, but to reduce our expenditure for foreign, and especially American products in order to bring the trade balance back more nearly to its normal position.

Just what effect this import duty would have had on tires if continued is a matter of speculation. Its immediate effect was the raising of prices by some of the tire manufacturers with plants in this country and the circulation of reports that some of the American manufacturers who have found an English market intended to establish factories in England. Just how much revenue would actually have been derived from such a tax is problematical, but there is plenty of evidence showing that our home manufacturers have not been able to supply the British demand for tires, in view of which fact undoubtedly a considerable importation would have continued.

With respect to the war tax on increased property, government contractors note with satisfaction that this applies to traders generally and not only to those who are entitled to write "contractors to the government departments" on their note paper. The tax has certainly been received with satisfaction by the army of professional men who, during the last twelve months, have seen their incomes, like the Snark, fading softly and silently away. It is perhaps not unnatural, however, that there should be a certain amount of grumbling among manufacturers of war material, which includes tires, at giving up 50 per cent. of their profits, which had been set aside for the payment of extensions to buildings now in progress. Such extensions, they argue, would not have been required for ordinary business and will be only partially utilized when affairs have returned to the normal. At many of our rubber works enlargement and rebuilding on a considerable scale is now in operation, and their position is certainly not on an equal plane with other concerns which have made large profits without any capital expenditure.

NEW RUBBER WORKS IN HOLLAND.

The rubber manufacturing firm of Wilhelmi & Co., of the Hevea works, Hoogezaand, has bought some factories at Doorwerth, near Arnhem, in order to take up the manufacture of motor and cycle tires. It is also stated that premises have been acquired at Naarden, which is 15 miles to the east of Amsterdam, for the same purpose. In an advertisement in the English press for machinery it is significant that reference is made to second-hand machinery. Doubtless if the firm wishes to get to work quickly it is useless to insist on a new plant. Owing to circumstances which it would be superfluous to enumerate, the delivery of new machinery cannot be guaranteed for any near date, and this has led to the anomalous situation of old machinery costing more than new. To give an instance, if you want to buy a certain type of spreading machine you will be quoted £130 [\$632.64] for a brand new one, delivery when you get it. On the other hand, you can get a second-hand machine delivered at once, but the price asked will be £170 [\$827.30].

With regard to the Dutch rubber industry, those readers who have retentive memories will recall an interesting article on some Rotterdam works written by Mr. Pearson on the occasion of a visit to Holland six or seven years ago. Holland in past

years has been a good market for British, German and American rubber goods, and the new works must naturally tend to decrease the country's imports. Arnhem, which is situated on the right bank of the Rhine, is the capital town of Gelderland—on account of its scenery called the "Dutch Paradise"—and is only a few miles from the German frontier.

RUBBER OR GUM.

Referring to the proceedings in the London Prize Court with regard to the rubber consignments on the steamship "Friedland" and steamship "Kim," I feel constrained to say a few words in this column. I have only seen press reports of the trial, and these are necessarily condensed; but from these reports it might be taken that H. L. Terry, who was quoted by Mr. Baird, really thought that rubber and gum were interchangeable terms. In Terry's book it is stated that the term "gum" was commonly used for rubber in America, but he goes on to state that this practice is decidedly objectionable. This point seems to call for mention, as quite possibly it was not put before the attorney-general, who spoke somewhat slightly of the author named. The real situation is a somewhat anomalous one, as there is plenty of evidence as to the use of the term "gum" for rubber in conversation, but apparently none whatever as to its use in invoices or other commercial documents.

In Great Britain its use appears to be limited to boots, especially army rubber boots, which are very generally termed by officers "gum boots." Whether such boots have been invoiced to officers as gum or rubber boots is a matter on which I am making enquiries. But the present case is concerned particularly with the raw material, which is only associated in Britain with the well-known clauses of patents which refer to rubber, gutta percha and allied gums. With regard to the Continent, it is noteworthy that while the German-speaking peoples and the Scandinavians use the single term "gummi," the Latin nations qualify it by adding elastic—in French, *gomme élastique*; in Italian, *gomme elastica*; and in Spain, *goma elastica*, being the terms in common use.

PERSONAL.

The president of the Board of Trade has appointed Mr. Vernon James Watney, J.P., to be an additional member of the committee which deals with questions relating to the export of rubber and tin from the United Kingdom and British Possessions. This brings the number of the committee to four.

George Spencer Moulton & Co., Limited, whose works are also at Bradford-on-Avon, has suffered a severe loss in the death in active service of Lieutenant Eric Moulton, son of John Moulton, chairman of the company, who is a brother of Lord Justice Moulton, who, as a Fellow of the Royal Society, has taken a very prominent part on the government High Explosives Committee. The deceased officer was a grandson of Alexander Moulton, the founder of the firm.

EXPORT OF RECLAIMED RUBBER.

The North Atlantic Lines Conference has somewhat arbitrarily refused to take any further shipments of reclaimed rubber to America from London, Liverpool and other West Coast ports. It appears that this is due to fear that such shipments may reach the enemy. At the same time such shipments are not altogether stopped, because they are proceeding from Hull, to which town the railway freight has, of course, to be paid. Those interested have made strong representation to the shipping companies operating in the West, but so far with no result. Crude rubber is, of course, being regularly shipped from London to America.

COTTON CLOTH EXPORTS.

By order of the Board of Trade, new restrictions which will chiefly affect Lancashire will shortly come into effect, a committee of the Manchester Chamber of Commerce being now engaged in arranging the details. With regard to cloths unsuitable for air craft purposes, a Chamber of Commerce certificate will suffice in case of export, while for cloth suitable for air craft purposes, application for export must be made to the War Trade department in London. The tests to discriminate between the two sorts are count weight and ratio of strength to weight.

RUBBER MILL EMPLOYEES AT THE FRONT.

The rolls of honor of employees serving with the forces exhibited at most of our rubber works continue to grow in volume with the prolongation of hostilities. That at Charles Macintosh & Co.'s works now contains over 600 names. Regular collections have been made in their works for the various war funds, in every case the sum collected being supplemented by an equal sum subscribed by the company.

THE SIRDAR TIRE & RUBBER CO.

I may add to the notice I recently gave about the resuscitation of this Bradford-on-Avon company that the capital is held by the Avon Rubber Co., Limited, which runs it as a separate branch of its own business, in this respect following the procedure of an eminent firm in the north of England. The works are fully equipped with up-to-date machinery and have been kept in operation since the time the old company got into financial difficulties.

MORE FIRES.

An outbreak of fire, fortunately not of a serious nature, occurred on September 23 at the waterproofing works of J. Mandlerberg & Co., Limited, Manchester.

Another fire of a more disastrous character broke out on October 1 at the works of J. E. Baxter & Co., Limited, which closely adjoin the Leyland & Birmingham Co.'s works at Leyland. The latter company's brigade worked hard both to subdue the outbreak and to prevent its extension to their own premises, a matter in which they were successful. The damage done on the scene of the fire was considerable, the cause being attributed to vapors from a spreading-machine catching fire.

VARIED ACTIVITIES OF THE FRENCH MICHELIN TIRE CO.

Since the war broke out in Europe the Michelin Tire Co., of Clermont-Ferrand, France, which is one of the largest tire manufacturing concerns in Europe, has been producing 6,000 pneumatic automobile tires per day. A great proportion of these tires are of the steel-studded leather-tread type which is very popular in Continental Europe, where almost every car is equipped with at least one rear tire of this type. The Michelin company does not manufacture solid rubber tires, but has an important valve manufacturing department which is now producing 8,000 fuses and 500 high explosive shells per day, and a wheel manufacturing department now engaged in manufacturing artillery wheels for the army.

ETABLISSEMENTS HUTCHINSON.

At the annual shareholders' meeting of the Etablissements Hutchinson, which was held recently in Paris, France, it was stated that the company's profits for the fiscal year 1914-1915 amounted to 2,446,152.65 francs (\$472,107) as compared with 2,353,188.72 francs (\$454,165) in the preceding year, showing an increase of \$17,942. The president of the company, Mr. Georges Lelièvre, stated that in spite of the many difficulties the present year promised to be very satisfactory.

It will be remembered that the Etablissements Hutchinson is an important rubber manufacturing concern which was established in France in 1853 by Hiram Hutchinson, an American.

MR. MANDERS APPOINTED PRESS MANAGER.

THE Rubber Growers' Association, of London, has appointed A. Staines Manders as its press manager, and a better selection could not have been made in all England. Getting the press to devote its valuable space to commercial topics is an art. It is altogether a legitimate art, for the press is always glad to print what will appeal to its readers, even though it may advance the interests of some particular industry, and Mr. Manders has the gift as few men possess it of bringing to the attention of the press the most interesting features connected with the rubber industry.

It will probably be remembered that when he arrived in New York some months previous to the rubber show, held in that city in 1912, to finish the preparations necessary for that event, he was interviewed regarding his mission by the reporters of the New York papers. He gave them much valuable information regarding the rubber exposition that was to be, but one particular statement which he made, namely, that scientific analysis had shown that the dust of the city streets—through attrition of tires, heels and horse shoe pads—was 12 per cent. rubber, struck the reporters as something distinctly new, and as a result of that interview a great deal of space in the American press, including both city and rural papers, was given to the discussion of this new idea. It was discussed from its economic and sanitary standpoints, and in this way a great deal of public attention was directed towards the coming rubber show, which was of course what Mr. Manders wanted to accomplish.

Mr. Manders has organized and managed four international rubber expositions—three in London and one in New York—the success of which depended upon the amount of publicity the daily press of the two cities was willing to give these enterprises; and the amount of space which they received was ample proof that Mr. Manders knew just how to prepare his press matter so that it would pass the editorial test.

The Rubber Growers' Association, of London, represents the important planting interest of the East, which has already reached vast proportions and will soon be one of the great industries of the world. With Mr. Manders as the press manager of this Association the Eastern planters need never fear that their light will be hid under a bushel.

IMPORTS OF RUBBER GOODS INTO BRITISH SOUTH AFRICA.

Statistics of imports of rubber goods into British South Africa are given under two headings only—conveying hose and rubber and gutta percha.

During 1914 the imports of conveying hose amounted to \$95,120, as compared with \$108,974 for the previous year, showing a decrease of \$13,854. Imports of rubber and gutta percha, specifically, amounted to \$116,479 and \$118,140 in 1914 and in 1913 respectively, showing a decrease of \$1,661 in 1914.



A. STAINES MANDERS.

The Rubber Trade in Germany.

By Our Regular Correspondent.

SINCE my last communication there has been no alteration in the general state of affairs here. At present there is a little more movement in commercial and industrial circles than there was at my last writing, but this is only the natural sequence of the dead summer season. Business continues to suffer from the confused conditions we are experiencing. Before this war we had no idea of the effect it would have on our commercial and industrial life. Practically all those doing any considerable business are working either directly or indirectly for the army. Manufacturers who never before had anything to do with government supplies are overrun with war orders. Industries that could exist only with difficulty in peace times are now doing a flourishing business, while others that were prosperous under normal conditions have been ruined by the war.

One of the greatest sources of trouble is the lack of orders. Everybody is either saving or has nothing to spend, a state of affairs most injurious to general trade. The rubber industry is, of course, not an exception to the general rule. While large dealers having direct or indirect commercial connections with the government have more orders than they can fill, the small dealers cannot secure enough business for their needs.

The rubber industry, like all of our industries that depend upon foreign countries and the colonies for their supplies of raw materials, is suffering greatly from the present situation, but conditions would long ago have been worse than they are had not our manufacturers taken advantage of the low prices prevailing in the rubber markets just previous to the war, when they stocked large quantities of crude rubber. The government also deserves credit for the judicious manner in which it organized the preserving and distribution of raw materials. Now we realize the mistake we made in purchasing our crude rubber in foreign markets. Had Hamburg been our chief supplier of crude rubber, a larger stock of it would have been on hand there when the war broke out. Most of our manufacturers, however, purchased their crude rubber in foreign markets and the rubber trade of Hamburg, though great, was not a German trade; Hamburg was a receiving point for redistribution to other countries, especially Russia and Scandinavia.

Unskilled employees, including those who do not know how to make out an order and those who do not know how to fill one, are causing much trouble to both dealers and manufacturers. This will be readily understood when I state that in many cases not only all the old employees are at the front, but also the managers and employers themselves.

The number of articles no longer to be had in other than substitute qualities, like the list of those no longer to be had at all, is constantly increasing. The greatest trouble is that many substitute qualities do not give satisfactory service. Answering complaints and making adjustments have become the principal occupations of our dealers and manufacturers of rubber goods. The most difficult position is certainly that of the dealer who, to keep his trade, is obliged to make all sorts of promises and, not being backed up by the manufacturer's warranty, is obliged to make good at his own expense, or lose his customers.

The demand for rubber coats never has been so large in Germany as in the last year. Good crude rubber is essential in making rubberized garments. Substitute rubber-proofing gives poor service. Our manufacturers are not allowed to use crude rubber for making garments and can only deliver "war

qualities"; but the prices asked for these garments have been extremely high and have led customers to believe they were getting the very best Germany can produce. As this is certainly not the case, much discredit has fallen on rubber coats and other garments of native manufacture. We fear that the industry will suffer from this false impression, and those interested have already organized to explain matters to the public and make it clear that German rubber coats should not be judged from the quality of those purchased this year under war conditions. An "Association of German Rubber Garment Manufacturers" has been formed, with headquarters in Berlin, for the protection of the German rubber garment industry.

Many rubber manufacturers here are relieving their difficult situation by producing small articles for the comfort of the troops in the field. Of this class of articles are ground-cloths, proofed caps, proofed face and neck protectors, gas-masks and the like. These are sold by mail-order, mostly, but also by dealers, either direct to the soldiers at the front or to their relatives at home, who forward the goods to them. Military doctors have been prescribing foot-arches for men suffering from flat feet. The continuous strain of long marches with heavy equipment has caused much suffering from this source and the manufacture of foot-arches has become a feature of the business of many of our rubber manufacturers.

One peculiar effect of the war has been the increase in the demand for flexible truncheons or clubs of the type used by the London police force. These truncheons are made of a combination of rubber and fabric. They are not used by our troops for defending the Fatherland, but are purchased by the people at home for their personal protection against the tramps and vagabonds that infest the country in these troubled times.

Returning to the subject of substitutes or "war qualities," as we call them here, tire casings made from reclaimed rubber are giving fairly good service on bicycles, but inner tubes made from reclaimed rubber are of no value at all, and several organizations interested in tires have petitioned the Imperial War Minister asking that small quantities of crude rubber be allowed to manufacturers from time to time for making inner tubes.

The mechanical packing trade, which has suffered less than others, is now badly affected by the high cost of asbestos, which, owing to the shortage of rubber, has been used in great quantities for mechanical purposes. Lately the price of asbestos and asbestos articles has increased 25 per cent.

The spinning and weaving industries, which heretofore have been very active, have been much curtailed because of the fact that the government has been obliged to restrain and regulate the use of textiles. According to the latest government decree spinning and weaving factories must not work more than 10 hours per day and not more than five days per week.

The surgical rubber industry is now obliged to follow the same course as other industries and offer substitute qualities. The army and navy sanitary services alone are still receiving first-class surgical rubber goods. In Belgium our military governor has prohibited the manufacture of surgical goods and also of leather goods, except in cases where special permission is granted by the delegate of our war department attached to the Belgian service.

The price of rubber insulated wires, all of which are being made in substitute qualities only, recently increased 20 per cent.

Benzol and naphtha solvents can now only be used by firms working directly or indirectly on government orders. A recent decree fixed the qualities and prices of these solvents as follows:

	Marks.	U. S. Currency.
Pure alcohol per 100 lbs.	45	\$40.71
Pure naphtha solvent and xylol	63	14.90
Combination of 70% benzol and 30% alcohol	67	15.93
Combination of 35% benzol and 75% alcohol	74	17.61

Other combinations or mixtures than those above given are not allowed. The shortage of crude rubber and the general use of reclaimed qualities make the rubber reclaiming business exceptionally good; all the reclaimers here are very busy.

We hear that the advance of our troops in Russian territory has obliged the "Prowodnik" factory to remove to Charkow, and that there is even a question of transferring this huge rubber plant to a point beyond the Ural mountains.

Our rubber manufacturers have been large contributors to all the government's war loans. Only recently the Continental company of Hanover contributed 5,000,000 marks to the third war loan, while its employees subscribed 1,000,000 marks, making the total contribution of the Continental works 6,000,000 marks [\$1,428,000] for the third loan alone.

The reopening of our foreign trade after the war is a subject that is receiving much serious attention here. In my last letter I mentioned rumors of German interests collecting large quantities of raw materials in neutral foreign countries to be rushed to Germany as soon as peace is resumed. Meetings have been held and will continue to be held by representative organizations to discuss the future of our foreign commerce.

The scarcity of rubber and manufactured rubber goods led our government recently to instruct school teachers to tell their pupils to search the roadways over which they pass and pick up all pieces of glass and sharp metal likely to injure the tires of cycles and motor vehicles. From all sides we hear that the effect of these orders has been magical and that tire trouble brought about by glass, nails, sharp iron junk, etc., is now quite insignificant.

A GERMAN VIEW OF THE EFFECT OF THE WAR ON THE WORLD'S MARKETS FOR RUBBER GOODS.

A RECENT issue of the "Gummi-Zeitung," published in Berlin, contains a comprehensive article giving the German view of the effect of the war on the world's markets for rubber goods and the possible future of the international trade in this line. Here is the gist of the article:

Before the war broke out the world markets had been well stocked in rubber goods of all kinds, with the possible exception of mechanical goods and toys. The demand for mechanical goods is one of the most constant and regular in the rubber trade. Germany was perhaps the most important supplier of the world's requirements in this line, but England, France and the United States also produced and exported large quantities of rubber mechanical goods. There being so many sources of supply, importers and dealers felt sure that, should any one of their providers become incapacitated, they could rely on the others to supply their demands.

In this they made a grievous mistake. Germany was cut off by the war, but England and France could not take her place, for their manufacturers were too busy manufacturing for domestic and war needs. There remained the United States, who accepted an agreement with England that has tied up her export trade in rubber goods. Even were there no such contract to restrict their operations, American manufacturers could do but little foreign trade, for their domestic market absorbs practically all their production of rubber mechanical goods. The result is that most European countries have all they can do to supply their own needs, while

China and other foreign markets are obliged to suffer and wait.

Rubber footwear was part of the wearing apparel of practically every Chinaman. Northern China obtained most of its rubber goods from Russia, which can hardly be expected to be able to continue business under present conditions. The Allies are absorbing all the rubber footwear they can produce and a good portion of the American production. The rest of the American production is consumed by the domestic market. The same state of affairs exists throughout the rubber trade of the world. Germany hears from all sources that there is a shortage in rubber goods.

However, it cannot be said that the demand for rubber goods is very large. Outside of mechanical goods the demands have, generally speaking, been rather limited. The unsettled state of affairs leads merchants to purchase only from hand to mouth and to allow their stocks to become depleted. This practice will prevail until the war is ended. "What will happen then?" There will be a great boom in the rubber trade.

In spite of all the writings of the British press, South Americans and other neutrals will be glad to purchase German goods. Little inclination has been shown towards purchasing British goods. The trade Germany is losing while the war lasts goes to America. When South America shall have exhausted the supply of rubber goods Germany furnished her during the six months preceding the war she will look to the United States for further supplies. The British press states that Germany's losses are American profits. This is so. But America's gains are also British losses. Neither America nor England can compete successfully with German rubber goods, for their costs of production are too great. That is why they have been obliged to specialize in their exports of rubber goods. Germany sells all kinds of rubber goods, while they have to specialize in a few lines in which they can offer better conditions and prices. German merchants can offer the entire line as a whole at better prices and they will soon regain their supremacy when peace is re-established. America's gains will be but temporary except in a few special lines. The real loser in this war will be England.

CONDITIONS IN RUBBER TRADE IN HOLLAND.

The American Consul-General at Rotterdam, Holland, reports that only \$250,000 worth of rubber shares was subscribed to in the Netherlands in 1914, as compared with \$1,470,000 offered and subscribed to in that country during the previous year. Notwithstanding the fact that few shipments of rubber were received during the latter five months of 1914, the imports of crude rubber for that year exceeded those for 1913 by something like 650,000 pounds, the total for 1914 being 2,935,066 pounds, against 2,286,900 pounds for the preceding year.

The port of Rotterdam's exports of crude rubber to the United States amounted to \$302,520 in 1914 as compared with \$159,789 exported to this country in 1913, showing an increase of \$142,731. While the exports of rubber waste amounted to \$76,743 in 1913, Rotterdam only shipped \$19,188 of rubber waste to the United States during 1914.

RUBBER FAMINE IN SWEDEN.

Mention has already been made in these columns of the tire famine prevailing in Sweden through the government's failure to comply with Great Britain's request that it place an embargo on all exports of rubber and rubber goods. Late reports from reliable sources stated that matters had become so serious that only 160 motor cars were able to continue service in Stockholm owing to the shortage of tires. Lately, however, the government has acceded to the British demands and the serious situation created by the lack of rubber will no doubt soon be removed.

RUBBER PLANTING NOTES.

EFFECT OF THE WAR ON THE RUBBER TRADE OF THE NETHERLANDS INDIES.

CRUDE rubber, generally speaking, has not been injuriously affected by the war. On the contrary, the war appears to have benefited the rubber trade in many instances; this in spite of the fact that one of the world's largest consumers of crude rubber is cut off from all sources of supply. In any event, the war has caused some important changes in the world's rubber markets. Antwerp has ceased, at least temporarily, to be a crude rubber market and the Amsterdam market has been greatly affected. London has become even a greater center for crude rubber sales than it was before the war, and a new rubber market has been created at Batavia.

Americans and Japanese are now purchasing rubber in Batavia and having it shipped direct to destination. During the first five months of 1915 the exports of crude rubber from Batavia to America direct amounted to 2,596,906 pounds, as compared with 67,316 pounds during the corresponding period of 1914 and 13,708 pounds during the first five months of 1913. Batavia's direct exports to Japan during the first three months of 1915 aggregated 191,571 pounds, as compared with no exports of crude rubber at all in 1913.

On the other hand, only 532,145 pounds of crude rubber went from the Dutch East Indies to Holland during the first quarter of 1915 as compared with 1,572,973 pounds shipped during the corresponding period of 1914.

The difficulties experienced at the opening of the Batavia market through lack of shipping facilities have been overcome by the creation of regular steamship services between that port and the United States and Japan. Prices in the Batavia crude rubber market are based on London prices.

EXPORTS OF RUBBER FROM BURMA DURING 1914-1915.

The production of rubber in Burma is steadily increasing. During the fiscal year 1914-1915 the exports of crude rubber from this British colony amounted to 987,392 pounds, as compared with 765,073 pounds exported during the previous fiscal year. Of the exports for 1914-1915, 892,304 pounds were shipped to Great Britain and 82,992 pounds to the Straits Settlements, the remainder going to various other destinations.

RUBBER IN SOUTH INDIA.

The exports of crude rubber from the Presidency of South India, British India, during the fiscal year 1914-1915 increased 50 per cent. in quantity and 19 per cent. in value as compared with the previous fiscal year. Like many other countries, South India is having its labor troubles. These are of a peculiar kind. The tremendous growth of the rubber planting industry in Ceylon and Malaya creates an enormous demand for labor in these countries, which have been obliged to import coolies from abroad and especially from South India, with the result that labor is short on the plantations of the Presidency. Though the war has caused emigration to slacken somewhat, it still continues on an alarming scale, and several boards have been formed in South India to devise ways and means for checking the tide which is menacing the future of the local plantations. For the fiscal year 1914-1915, in spite of war conditions, 49,028 men, women and children left South India for the Straits Settlements, 79,757 went to Burma and 144,146 to Ceylon. During the previous fiscal year these emigrations amounted to 117,783 to Malaya, 130,725 to Burma and 190,059 to Ceylon.

CEYLON RUBBER PLANTATION ACREAGE

According to the Ceylon Blue Book for 1914 the total area under rubber in the island amounted, in 1914, to 168,178 acres. During that year 34,353,099 pounds of crude rubber were exported.

CEARA RUBBER IN BRITISH NORTHERN NIGERIA.

The hermann, an intensely dry land-wind of the coast of Africa, has always been a formidable barrier in the way of the cultivation of perennial plants in the northern provinces of British Nigeria, and, according to the 1913 and 1914 annual reports of the Agricultural Department of these provinces, published recently, experiments are being conducted by that department to determine how well *Ceara* rubber trees can be developed to resist this dreaded wind.

Ceara seed was sown at distances of 12 x 12 feet and germination was quite regular and uniform so that most of the saplings reached a height of 6 feet during the first six months. At this point the hermann caused the leaves to fall from the young *Ceara* plants, thus arresting their development. The experiments will continue.

MR. WRIGHT MAKES SOME ESTIMATES.

Writing recently of the past and future of the rubber planting industry, Herbert Wright, editor of "The India Rubber Journal," states that the world's consumption of crude rubber has been increasing, for the past five years, at the rate of at least 12 per cent. per annum. Though 1914 could not be considered a normal year, some of the world's most important consumers of crude rubber being shut off from supplies during half of the year, the consumption of crude rubber increased normally.

As to the future, Mr. Wright estimates the total Mid-Eastern production for 1915 at 80,000 tons. Regarding consumption he believes that America alone will consume 80,000 tons of crude rubber, and if the war should terminate during the year, Germany and Austria would need at least 40,000 tons to re-stock their factories and supply the urgent needs of their population. In his opinion the rubber planting industry will be in a much stronger position after the war than it ever was before.

PYROLIGNEOUS ACID FOR COAGULATING RUBBER.

Dry distillation of cocoanut shells yields crude acid of 10 to 12 per cent. strength. When diluted to 1 in 10 of water it can be used for producing smoked rubber at a greatly reduced cost.

THE RUBBER SITUATION IN DUTCH GUIANA.

By Our Regular Correspondent.

SUCCESSFUL HEVEA CULTIVATION IN DUTCH GUIANA.

THE Compagnie Des Mines D'or de la Guyane Hollandaise is to be congratulated on the successful cultivation of 39,418 rubber trees, 9,000 of which will be tapped for the first time during this year.

M. Gufroy, the president of the company—which is located in Paris—visited the colony as far back as 1906, and at the time contracted the rubber fever. He purchased thousands of seeds of the *Hevea Brasiliensis* variety, and took them along with him to the concessions, which are situated on the extreme limits of the colony bordering on the Brazilian frontier. The seeds were first planted out in nursery beds and afterwards transplanted on the hill sides of the mine. They grew wonderfully, and in almost every case are today fully developed, and, as before stated, tapping operations are to begin during this year.

This French concern deserves great praise for the foresight displayed by the president in adding to the revenues of the mine, which, by the way, is the largest gold producer in Dutch Guiana. In 1914 no less than 328½ kilograms pure gold was produced by the crudest methods of hand labor, and it is expected that by the end of 1915 their revenues will be greatly increased by the addition of a big rubber production.

It is the intention of the company to plant out every available foot of land on the property with *Hevea Brasiliensis*, and so create a monopoly in the business in future.

The close proximity to the forest of Brazil, the home of the *Hevea*, may in a measure account for the rapid and successful growth of the trees on the company's concessions. It must not be forgotten that the land on which these 39,418 rubber trees are flourishing so luxuriantly is purely mountainous and rather rocky. This fact goes to prove the theory of some planters in the colony to be all wrong that *Hevea* only thrives well on the flat marshy soils on the coast, where the plantations are located. The distance from the coast to the mines is about 200 miles, along the winding Maroni river, and then into the Lawa, which takes its rise in the Tumuc Humac mountains, which divide the colony of Dutch Guiana from Brazil.

REVIVAL OF THE BALATA INDUSTRY.

Although bleeding operations began late in the season, the returns have been considered satisfactory under the circumstances, and the amount of balata so far reported at the Custom House is 745,960 kilograms [1,641,112 pounds]. There are several thousand kilos, however, not yet ready for shipment from the concessions to Paramaribo, owing to the dry state of the upper rivers which renders transportation slow and expensive. A journey that is accomplished under normal conditions in three or four days sometimes in dry weather requires as much as twenty days.

Balata gathering, with the thousand and one difficulties connected therewith, is not an ideal job and those engaged in the business are deserving of every encouragement and support.

The company in New York that was instrumental in adjusting the new ordinance, through the authorities at Washington, of which mention was made in the September number of THE INDIA RUBBER WORLD, is doing well and expects to reap a good harvest of balata, although operations began late in the season. This concern is operating with a very large number of laborers and has a substantial office administration in Paramaribo. It is an example of what can be accomplished when capital and intelligence are combined.

Since my last communication, importations from the United States have increased by 100 per cent., and, especially noticeable are such commodities as beef, pork, flour, fish, canned goods, with a large quantity of kerosene oil and gasoline. This increase in the imports only goes to prove that matters are being gradually adjusted in the balata business, and that in the course of time this once flourishing industry will revive and become, as in times past, the colony's main source of revenue.

The prospecting season begins in a few days, and several expeditions are leaving town for the interior, where line-cutting will continue until the end of the year. It is said by some well-informed people that vast tracts of country have been recently discovered with as many as ten trees of tappable size to the acre.

LEAF DISEASES ON THE RUBBER PLANTATIONS IN SURINAM AND BRITISH GUIANA.

In consequence of the reported outbreak of leaf disease in connection with the rubber trees on some of the plantations in the colony, I communicated with a plantation proprietor in British Guiana—where all, or nearly all, of the trees are said to be afflicted—to ascertain what steps had been taken in that colony to check the spread of the disorder, and was informed that G. E. Bodkin, the government economic biologist, had left Georgetown for the government experimental station at Christianburg, where he will undertake certain measures to ascertain the most effective way of controlling the disease by spraying.

The disease is said to have affected the rubber trees at the Consolidated Co.'s plantations in the northwest and on the Essequibo, at Coven den on the Demerara river, Greenheart Camp, and at the Christianburg experimental station. It has not yet been ascertained whether Berbice county has been affected also.

Professor Harrison has stated that the disease was first noticed by him about 1900, at Noitgedacht, in the Canal Polder, and then at Greenheart Camp, and subsequently at Christianburg, where the government experimental station is located. His de-

partment investigated, and since that time the disease has been reported at various rubber estates. Some of them have been very extensively attacked, and some slightly, where the pest was looked after in time. Now the department is taking steps to see what is the most effective way of dealing with the disease. He anticipates that on the return of the government biologist from Christianburg he will be able to give some definite facts.

Professor Harrison pointed out that the most unfortunate part of the disease was that after it attacked the plants it checked their growth. Then after the leaves had fallen there was always the possibility of the disease extending to the other plants. It is wise to keep the disease under control at an early period; but complaints are now coming in from planters who possibly have not done so. Professor Harrison was also of the opinion that the disease had possibly spread from the native to the cultivated rubber trees.

Mr. Petch, the government mycologist at Ceylon, writing recently about the leaf diseases of the *Hevea brasiliensis*, said: "The fungus which causes the diseases was first described by Hennings in 1904, under the name of *Dothidea Ulci*. The specimens had been collected by Ule in the upper Amazon Valley, Jurua (Acre Territory), on the banks of the Rio Jurua, Mirum (Acre Territory), and on the banks of the Amazon in the neighborhood of Iquitos (Peru). Hennings did not give an account of the injuries caused by the fungus. Dr. Huber, however, on the occasion of his visit to Ceylon, stated that it sometimes caused serious damage and defoliated the trees. In 1911," continues Mr. Petch, "Dr. J. Kuyper described what was considered a different leaf disease of *Hevea* from Surinam. The disease occurs in three forms. In the first stage the young leaves, only three to five days old, exhibit transparent olive green or dark green patches, which are sometimes so numerous that the whole leaf blackens and collapses. In the nurseries, sometimes, every plant is attacked. *Hevea* leaves grow rapidly, and apparently the fungus cannot attack the older tissues. More recently, Bancroft has recorded another leaf disease, from British Guiana. The symptoms were a spotting of the leaves, followed by an increase in the size of the spots, with the production of dried areas which eventually fall away from the green parts, leaving holes in the leaf surface." Mr. Petch concludes that it would appear probable, therefore, that the British Guiana leaf disease is the same as that of Brazil and Surinam.

The Department of Agriculture at Paramaribo is now making extensive examinations on many of the rubber plantations with a view of adopting the best scientific measures for combating the disease. On a recent visit to plantation Voorburg the courteous manager, Mr. Arntz, was kind enough to take me through his drying factory, where I was treated to a sight of nearly 1,000 kilograms of fine Para rubber in sheets. This plantation is run by an experienced man and can lay claim to being the best rubber producing estate in Dutch Guiana.

Mr. Arntz informed me that previous to his trip to the Far East last year he was quite pessimistic about the rubber industry ever making good in the colony, but since he was in a position to see for himself and to study Far East conditions he has now become quite an optimist and entertains great hopes for the future rubber industry in Dutch Guiana.

ARGENTINE EXPORT PROHIBITION.

A recent presidential decree of the Argentine Republic prohibits, among numerous other things, the exportation of rubber goods.

VENEZUELAN CUSTOMS TARIFF LAW.

The Republic of Venezuela has promulgated a new customs tariff law, in which goods are specified under categories rather than under each class of the tariff. Waterproof clothes of wool and rubber are dutiable at 10 per cent. ad valorem; while waterproof clothes of cotton and rubber are taxed 25 per cent. specific; rubber belting at 25 per cent. specific, and suspenders, braces and garters at 50 per cent. specific.

THE RUBBER SITUATION IN THE AMAZONS.

By Our Regular Correspondent.

THERE has been a genuine awakening here since my last letter. Our people are beginning to see the real cause of their troubles, and there is a serious movement under way to find a remedy. We are actually starting to devise rational ways and means for reorganizing the economical life of the country.

Rubber was for many years the sole foundation of the economical edifice in this part of Brazil. We called it "black gold," and it was almost as stable a standard as gold as long as we held the monopoly of its production. But we have lost this monopoly. We are no longer first among the world's producers of crude rubber. Other countries now produce and sell more rubber than we do. Our standard is depreciated; the foundation of our economical structure is gone and with it the structure itself. We shall have to rebuild.

When the present crisis was first felt, in 1913, we believed it to be the same sort of experience we had passed through so often before. But we were mistaken. The present crisis is not like the others; it is deeper rooted. It is a crisis of transition, a phenomenon of economical evolution. There is no use counting, as heretofore, on some intervention of Providence; we must act ourselves and waste no more time in vain hopes. To count on the destruction of Eastern plantations by disease or plague, as some have been disposed to do, is pure folly. No more relief for us can be hoped from this source than from the war. When the latter broke out and prices of crude rubber increased, many of our people felt sure that old averages would again be attained. You know how faulty this calculation has turned out to be.

We must reorganize and rebuild. Rubber is going to count in the future prosperity of this part of the Union, but it will not be all, as it was in the past. The greatest obstacle in our way certainly is tradition—old habits. Our soil, of course, is perfect for the rapid and healthy development of rubber plantations. We certainly can produce as good, if not better, rubber than other countries, and we are nearer than they are to the consuming markets. Our whole problem is the reduction of the cost of production. The lack of labor, which has always been an obstacle in the way of reducing the cost of our crude rubber, is being remedied by extensive immigration, mostly from the southern Brazilian states. The great factor in the cost of crude rubber production now, as heretofore, is the expense of living, which must be materially reduced.

Here is where habit stands in our way. Our people are so used to relying on foreign countries for their supply of the necessities of life that it is not easy to educate them to understand that this system is the principal cause of their troubles. But the people are beginning to pay more attention to the production of the necessities of life. Farming and stock-raising will decrease the amount of our imports, and consequently they will lessen the amount of money spent abroad. Coöperative associations for production and consumption are being organized. Rural credit will be developed and organized to facilitate the purchase of the necessary implements for farming and for raising stock.

Modern agricultural systems will be substituted for the primitive methods now generally in vogue in this country. The work of reorganization has started and it will be carried on actively, though with care not to interfere more than necessary with present business methods.

Our forest wealth will continue to be exploited and at the same time improved. Our people will be taught to recognize the possibilities their land offers them. New means of communication and new markets will be created, while those already in existence will be modernized and improved. Private shipping concerns will be encouraged, and we believe the best way to do this is to see that they are supplied with freight to carry the whole year round. When the economical transformation of the Amazons shall be an accomplished fact, with the abundant

local production of the necessities of life, and with increased trading facilities, incidentally we certainly shall be able to compete with the Orient, whose sole advantage lies in low cost of production. The future of this country is not so black as many are inclined to believe it to be. Our new economical edifice will be built with rubber as part of its foundation, and not as the whole foundation, as it was in the case of the old structure now wrecked.

There is a rumor here that the government intends to send a national transport steamer, the "Sargento Albuquerque," to Holland with a cargo of coffee, crude rubber and other products.

Statistics for the fiscal year 1914-1915 show that our exports of crude rubber amounted to only 35,305 tons as compared with 39,115 tons exported during previous fiscal year—a decrease of more than 9 per cent.

AUTOMOBILE TIRES IN BRAZIL.

Crude rubber is the second in importance of Brazil's exports, but there are no automobile tire factories in Brazil, where, up to the present time, French, English, German, Italian and Belgian tires have dominated the market. This fact is principally due to the experience of European exporters and the long credits they allow to reliable dealers in Brazil. European tires are furnished in all styles and sizes to meet the requirements of American as well as of European-made cars. American tire manufacturers only supply about 3 per cent. of all the tires used.

The customs duty on automobile tires was 5 per cent. ad valorem until March 31, 1915, when the new law for protecting Brazilian rubber was put in force and an import duty of 50 per cent. ad valorem placed on all automobile tires not made of fine Para. As is known, the customs officials were unable to enforce this law owing to the difficulty of determining the origin of the rubber. New rulings have modified the law so that now importers, on paying the old duty of 5 per cent. ad valorem, sign a promise to pay the difference of 45 per cent. in the event the legislature should fail to repeal the "fine Para" law.

The Michelin Tire Co., of France, whose tires have quite a vogue in Brazil, publishes normal price lists for all of its types and sizes of tires, together with the extra charge imposed by reason of the increase in Brazilian customs rates, and binds itself to refund these surcharges to the purchaser in the event the law is repealed. For instance, the Michelin price lists show: 34 x 4-inch tire-casing, "Semelle" type (leather steel-studded non-skid tread), normal price \$40.75; supplementary charge \$14—to be refunded should Congress repeal the "fine Para" tariff law.

WILL AMAZONAS PERMIT "CUTTING" OUTSIDE THE STATE?

Manaos owes her commercial supremacy to the old law which prevents "cutting" rubber outside the boundaries of the state. There has been a rumor of a recent discussion in the State Congress of Amazonas concerning a change in this time-honored decree. Should the law be changed permitting rubber to be "cut" outside of Amazonas it will be a severe blow to the rubber commerce of Manaos. "Cutting," it might be added, is a collective term that denotes cutting, grading, sorting, packing and shipping.

EXPORT TAX ON RUBBER ADVANCED BY THE STATE OF AMAZONAS.

A law has been passed by the Congress of the State of Amazonas, Brazil, raising the export duty on rubber from 15 per cent. to 18 per cent. This action was taken without the slightest warning and caused consternation in the trade. Many exporters had already bought several hundred tons of rubber on the 15 per cent. basis and were faced with a loss of 3 per cent. The Chamber of Commerce of Manaos has protested to the Governor, who finally permitted shipments to go forward at the 15 per cent. rate by the first American and European steamers sailing after the new tax was declared.

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED SEPTEMBER 21, 1915.

- 1,154,948. Vehicle wheel. H. V. Pannecoucke and H. Schaefer—both of Detroit, Mich.
 1,154,954. Tread cap. G. C. Reeves, Chicago, Ill.
 1,154,969. Audiophone. C. Soret, Havre, France.
 1,154,979. Resilient tire. D. M. Kamper, assignor of forty-seven and one-half one hundredths to J. Rosenwasser—both of New York, N. Y.
 1,154,984. Spanner or wrench for use with a detachable vehicle wheel. W. Wright, Stoke Park, Gwent, assignor to The Dunlop Rubber Co., Limited, Aston Cross, near Birmingham—both in England.
 1,154,996. Vehicle wheel rim. W. F. Stengel, assignor of one-half to J. Benker—both of Akron, Ohio.
 1,154,998. Demountable rim. J. J. Stosick, South Milwaukee, Wis.
 1,154,999. Hose coupling. C. H. Light, Des Moines, Iowa.
 1,154,999. Undergarment in which elastic fabric is used. A. Wylie, Rockville Center, N. Y.
 1,154,999. Collapsible rim. W. B. Christopher, assignor of one-half to C. C. Baxter—both of Birmingham, Ala.
 1,154,999. Tire filler. H. J. S. Keim, Catsaqua, Pa.
 1,154,999. Battery cell. A. P. Burritt, Ozone Park, N. Y.
 1,154,999. Tool for repairing tires. F. Severson, Munich, Pa.
 1,154,999. Filling device with rubber sleeve. H. S. Benjamin, Rochester, N. Y.
 1,154,999. Resilient tire for road vehicle. W. H. Carmont, Kingston, England.
 1,154,999. Orthopedic cushion. L. DeOliva Delo, New York, N. Y.
 1,154,999. Wheel with flexible tire. J. F. Evans, Martinsburg, W. Va.
 1,154,999. Vehicle wheel tire. A. W. Gano, Carrollton, Ill.
 1,154,999. Anti-skidding and traction appliance for vehicle wheel. J. McMullen, Butte, Mont.
 1,154,999. Game table with elastic cushions. L. Meluzzi, Buenos Aires, Argentina.
 1,154,999. Hose supporter. B. S. Alsop, New York, N. Y.

ISSUED SEPTEMBER 28, 1915.

- 1,154,629. Demountable rim. C. C. Harbridge, assignor to Detroit Demountable Rim Co.—both of Detroit, Mich.
 1,154,817. Multiple chamber pneumatic tire. J. W. Turner, Kirksville, Mo.
 1,154,848. Pneumatic tire. H. S. Dew, De Walt, and W. H. Minton, Missouri City—both in Tex.
 1,155,018. Piston packing. G. S. Towne, Oakland, Cal.
 1,155,025. Rubber tread flexible armor for pneumatic tire. C. L. Wolfe, Brooklyn, N. Y.
 1,155,046. Storage battery. W. A. Crowds, assignor of one-half to Atkinson, Mentzer & Co.—both of Chicago, Ill.
 1,155,047. Storage battery. W. A. Crowds, assignor of one-half to Atkinson, Mentzer & Co.—both of Chicago, Ill.
 1,155,053. Tire of shoe holder for automobiles. F. W. Ehrlich, Newark, assignor to E. A. Whitehouse Mfg. Co.—both in New Jersey.
 1,155,209. Heel grip. M. H. Burke, Denver, Colo.
 1,155,246. Resilient wheel. A. Jutila, Fort, Minn.
 1,155,255. Tire. J. E. McCaughey, Gary, Ind.
 1,155,255. Wheel for self propelled vehicle. J. McGeorge, assignor to The Cleveland Engineering Co.—both of Cleveland, Ohio.

ISSUED OCTOBER 5, 1915.

- 1,155,367. Liner for pneumatic tires. F. E. Neal, Anderson, Ind.
 1,155,394. Pneumatic tire mounting. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.
 1,155,395. Vehicle wheel. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.
 1,155,396. Mounting for tire. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.
 1,155,397. Vehicle wheel. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.
 1,155,398. Demountable rim for automobile wheels. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.
 1,155,413. Non-skidding device. M. C. Gannett, Brooklyn, N. Y.
 1,155,417. Pneumatic tire mounting. C. G. Hawley, and E. K. Baker, assignors to Universal Rim Co.—both of Chicago, Ill.
 1,155,575. Core formed of a resilient rubber substitute. W. Hoskins, La Grange, Ill.
 1,155,577. Patch for pneumatic tire. L. H. Israel, Fairfield, Iowa.
 1,155,584. Medicine dropper. F. C. La Grange, Cedar Rapids, Iowa.
 1,155,611. Fountain pen. H. W. Pierce, Waverly, Mass.
 1,155,644. Rubber shoe. J. T. Crowley, assignor to The Beacon Falls Rubber Shoe Co.—both of Beacon Falls, Conn.
 1,155,646. Hose clamp. F. P. D'Arcy, Kalamazoo, Mich.
 1,155,659. Catametal belt of elastic webbing. E. Johnson, Cincinnati, Ohio.

- 1,155,693. Fountain pen. R. L. Warnock, Ohio.
 1,155,775. Inner tube for pneumatic tire. J. J. Voorhees, Jersey City, N. J., assignor to Brown Perfection Tube Co., New York, N. Y.
 1,155,848. Rectal syringe. C. A. Tyrell, New York, N. Y.
 1,155,864. Corset with elastic inserts. A. Abt, assignor to The Warner Brothers Co.—both of Bridgeport, Conn.
 1,155,865. Elastic wheel. E. Amond, Paris, France.
 1,155,874. Friction and metal plug for rubber heels and other tread surfaces. F. Berenstein, Chelsea, assignor of one-half to W. Berenstein, Boston—both in Mass.
 1,155,919. Tire deflating tool. W. C. Gunnell, Cadiz, Ohio.
 1,155,982. Attachable outer sole for boots and shoes. R. M. Withycombe, Sydney, New South Wales, Australia.

ISSUED OCTOBER 12, 1915.

- 1,156,054. Hot water bottle. W. M. Brown, Cambridge, Mass.
 1,156,099. Vehicle wheel. L. Risk, Waterloo, Iowa.
 1,156,153. Vehicle wheel having a solid rubber tire. R. Kronenberg, Ohlms, Germany.
 1,156,155. Vehicle tire. N. R. Landis, Portland, Ore.
 1,156,172. Bed pan constructed of rubber. I. Poindexter, Prineville, Ore.
 1,156,202. Breast shield. A. C. Barrett, Montgomery, Ala.
 1,156,238. Bathing cap. I. W. Litchfield, Newton, Mass.
 1,156,242. Cushion wheel. C. T. Miller, Menard, Ill.
 1,156,268. Combined tire valve and pressure gauge. O. F. R. Bromberg, San Diego, Cal.
 1,156,278. Vacuum horsehoe. J. M. Dove, assignor to C. P. Dryden—both of Chicago, Ill.
 1,156,293. Recoil pad for guns having a soft rubber cushion. W. R. Jorgensen, Chicago, Ill.
 1,156,328. Pressure regulating device for tire valves. C. H. Thayer, assignor of one-fourth to G. P. Ransom, one-fourth to G. A. Gucker, and one-fourth to M. L. Sullivan—all of Elmira, N. Y.
 1,156,393. Elastic garter. A. P. Coolbroth, Cambridge, Mass.
 1,156,487. Hat or cap band with section of elastic. S. Kunstadter, Chicago, Ill.
 1,156,533. Invalid cushion having an inflatable cushion body. J. A. Clemens, assignor to Davol Rubber Co.—both of Providence, R. I.
 1,156,706. Hose rack. C. Nuhring, Cincinnati, Ohio.
 1,156,719. Float valve mechanism with an inflated rubber bag. R. L. Stokes, assignor to W. H. Darrow, both of Cincinnati, Ohio.
 1,156,740. Blanket holder including a strip of elastic material. C. M. Berdan, Maywood, N. J.
 1,156,748. Spring and presser bar for fountain pens. E. F. Britten, Jr., Jersey City, New Jersey, assignor to L. E. Waterman Co., New York, N. Y.
 1,156,749. Life saving belt or buoy. J. Brown, Liverpool, England.
 1,156,808. Bust reducer. Brassiere, M. Perillat, assignor to Ye Lady's Outfitter—both of New York, N. Y.
 1,156,835. Elastic garment supporter. D. G. Butts, assignor to The Ivory Garter Co.—both of New Orleans, La.
 1,156,861. Pneumatic tire gate. R. C. Sibley, Boston, Mass.

FOREIGN.

- 13,593. Tennis shoe. N. E. Tinsley, Watertown, and C. H. Roper, Belmont, assignors to Houd Rubber Co., Watertown—all in Massachusetts.

UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent at the filing of the application, which in the case of these listed below was in 1914.

*Denotes Patents for American Inventions.

- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, SEPTEMBER 15, 1915.]
 12,230 (1914). Reservoir pen. F. Raynaud, 32 Faubourg Poissonnière, Paris.
 12,262 (1914). Device for marking boxes, etc., comprising a cylinder containing rubber. H. A. Wiseman, 109 Hulsworth Square, Gray's Inn Road, London.
 *12,271 (1914). India rubber. F. V. O'Neill, 117 Draper street, Dorchester District, Boston, Massachusetts, U. S. A.
 12,278 (1914). Wheel tire. S. E. Page, 27 Chancery Lane, London.
 12,306 (1914). Spring wheel with pneumatic cushion. R. T. Park, 137 York street, South Melbourne, Victoria, Australia.
 12,363 (1914). Tire attachment to rim. T. Dunn, 8 Sherwood street, Piccadilly Circus, London.
 12,366 (1914). Fabric used in the manufacture of hose. W. J. Mellersh-Jackson, 28 Southampton Buildings, London.
 12,419 (1914). Diving dress. G. Hecht & Kuhnke, Werk Ravensberg, am Halbsburger Ring, Kiel, Germany.
 12,430 (1914). Diving suit. Neufeldt & Kuhnke, Werk Ravensberg, am Halbsburger Ring, Kiel, Germany.

- 12,421 (1914). Diving suit. W. P. Thompson, 6 Lord street, Liverpool.
 12,422 (1914). Diving suit. W. P. Thompson, 6 Lord street, Liverpool.
 12,440 (1914). Flexible tubing and hose made from a rubber substitute composition. R. A. Nestler and K. A. Gaston—both of Waco, Texas, and L. Traube, 18A Am. Intero., Charlottenburg—both in Germany.

12,500 (1914). Apparatus for detecting and closing punctures. F. W. Farr, 30 Bridge street, Northampton.

12,581 (1914). Ornamental belt and device attached to garments by a rubber solution of stitching. M. Furey, White House, Randolphston, Antirny, Ireland.

12,588 (1914). Brace or supporter having a number of elastic parts. H. Carhartt, 32A Hope street, Liverpool.

*12,632 (1914). Cover for wheel tire. J. D. Tew, 87 Rose avenue, Akron, Ohio, U. S. A.

12,663 (1914). Tire attachment to rim. C. J. Walker, The Tannery, St. James' Road, Northampton.

12,665 (1914). Rubber tire with a converging tread. M. Mettler, 34 Kochstrasse, Leipzig, Germany.

12,743 (1914). Siphon bottle with hard rubber stem. O. I. Lugster, British Syphon Mfg. Co., Barnsby Road, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, SEPTEMBER 22, 1915.]

12,837 (1914). Reservoir pen. Kilo-Werk Fabrik für Gebrauchsgegenstände Ges. Hennef-on-Sieg, Germany.

12,884 (1914). Ball. P. A. Martin, 31 Westwood Road, Edgbaston, and J. Stanley, 70 Ivor Road, Sparkhill—both in Birmingham.

12,902 (1914). Window casing made of rubber. E. K., W. P., and S. J. Bedington—all of 45 Northwood street, Birmingham.

12,919 (1914). Golf ball. A. E. Terry, Novelty Works, Redditch.

12,939 (1914). Wheel tire. G. Soper, High River, Brandt, Alberta, Canada.

13,000 (1914). Wearing apparel having rubber faced seams. I. Frankenburg & Sons, J. Frankenburg and J. Caseman—all of Greengate Rubber Works, Salford, Lancashire.

13,003 (1914). Stuffing box packing comprising cotton fibre which is treated with rubber solution and vulcanized. Puritas Disinfectants Co., Evington Valley Road, and H. C. Rought, 39 Evington Valley Road, Leicester.

13,009 (1914). Gramophones in which rubber tubing rings are used. H. D. and A. Taylor—both of Buckingham Works, Bishop-hill, York.

13,072 (1914). Photographic and like films containing rubber. J. E. Brandenberger, Thonon-les-Vosges, France.

13,110 (1914). Jacket and cover for wheel tire. T. R. Walton, 14 Spence Road, Walthamston, London.

*13,128 (1914). Rubber and leather compositions. E. B. Cook, 138 Holten street, Danvers, Massachusetts, U. S. A.

*13,142 (1914). Hypodermic syringe with rubber stopper. J. G. Castro, 3 Calle Tundidores, Granada, Spain.

13,157 (1914). Fountain tooth brush. A. Binning, Hatfield, and T. L. Greaves, Mill Green, Hatfield, Hertfordshire.

13,162 (1914). Tire valve. C. E. Baker, 34 Blue street, Carmarthen.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, SEPTEMBER 29, 1915.]

13,376 (1914). Elastic hair binder. L. Linton, Rockland Works, Eagle street, Coventry.

*13,419 (1914). Spring wheel with continuous outer rigid ring. E. F. Krell, 11 Jones street, Detroit, Michigan, U. S. A.

13,484 (1914). Rock drill with rubber pad. J. M. and J. L. Holman and J. L. Camborne, Cornwall.

13,485 (1914). Taper holder with flexible air bulb. S. Carvin, 34 Boundary street, Liverpool.

13,496 (1914). Pea shelling machine with two rubber covered rollers. E. L. Hunter, 131 Gilles street, and F. J. Sheridan, Harcourt Buildings, Victoria Place—both of Adelaide, South Australia.

13,573 (1914). Soles and heels with springs embedded in rubber. A. G. and R. G. Doyle, 46 Newlands Park, Sydenham, London.

13,589 (1914). Electrolysis; cells with ebonite frames. Soc. Anon. L'Oxydrique Francaise, 54 Rue Philippe de Girard, Paris.

13,609 (1914). Siphon bottle with rubber washer. G. Götli, 24 Humboldtstrasse, Aussig-on-the-Elbe, Austria.

13,640 (1914). Tire attachment to rims. Wolsley Tool & Motor Car Co., A. Remington, and J. G. Sweeney—all of Alderley Park, Birmingham.

13,761 (1914). Stocking protector of rubber. R. Molenkamp, 8 Rue Choron, Paris.

13,775 (1914). Hydroplane with air bag. J. Buchanan, 6 Ravelston Park, Edinburgh.

13,780 (1914). Spring wheel with pneumatic cushion. G. Singer, 15 Provençasse, Vienna, and R. Luzzato, 342 Commerciale, Trieste—both in Austria.

NEW ZEALAND.

[ABSTRACTED IN THE PATENT OFFICE JOURNAL, AUGUST 19, 1915.]

36,057 (1914). Attachable rubber outer sole for boot and shoe. R. M. Wylcombe, "Wycombe," Macquarie street, Sydney, N. S. W.

[ABSTRACTED IN THE PATENT OFFICE JOURNAL, SEPTEMBER 2, 1915.]

36,445 (1915). Elastic girth. A. C. Gill, Serpentine, Geelong, and C. Watson, 82 Barrack street, Perth—both in West Australia.

36,481 (1915). Preservation of pneumatic tire. E. Wood, 231 Elizabeth street, Melbourne, Victoria.

THE GERMAN EMPIRE.

PATENTS ISSUED (With Dates of Application).

287,618 (February 25, 1913). A steam or hot air bath that can be used in bed. Dr. Cassius Kossowatz, 11 Hingens. Represented by Messrs. T. Tannenberg and Heinrich Heilmann, Patent lawyers, Berlin SW. 68.

287,679 (November 12). Bed bath tub. Elizabeth Anna Mary Gallagher, New York City, U. S. A. Represented by E. Lamberts, Patent lawyer, Berlin SW. 61.

287,753 (October 27, 1914). Process for manufacturing field gray waterproof tent cloth. Hingens and Kossowatz, on-the-Rhine.

287,787 (September 4, 1912). Process for manufacturing a rubber-like substance. Badische Anilin- und Soda-Fabrik, Ludwigshafen-on-the-Rhine.

287,919 (July 10, 1914). Anti-Skid protector for motor vehicle tires. Bernhard Grotz, Berger Str. 28, Düsseldorf.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

476,052 (August 19, 1914). Lever for adjusting tire casing patches. F. Russell.

476,208 (April 9). Improved wheels for agricultural and road tractors, and similar machines. M. Gaudin.

476,292 (October 14). Heel with ridged metal plate. E. Le Roy.

476,351 (October 20). Improved rims for elastic wheels. G. Miller.

476,359 (October 20). Improvement to flexible parts, especially those for fastening auxiliary tires and anti-skid treads over tires of vehicle wheels. The Astin Chain & Hook Co.

476,418 (October 31). Reformer for pneumatic tires. A. F. Tiedge.

TRADE MARKS.

87,866. J. W. Buckley Rubber Co., New York, N. Y. The word *Buckley*. For rubber hose, rubber belting, rubber packing, etc.

87,254. The Mechanical Rubber Co., Jersey City, N. J. The planet Saturn with its ring, and the word *Saturn*. For machinery packing composed of rubber or rubber compounds.

DESIGNS.

47,861. Rubber boot. F. E. Payne, assignor to The Goodyear Rubber Co.—both of Middletown, Conn.

47,872. Pneumatic tire tread. P. E. Bosworth, assignor to The Victor Rubber Co.—both of Springfield, Ohio.

47,873. Vehicle tire. W. F. Bowers, San Francisco, Cal.

47,874. Container for hot water bottles and fountain syringes. L. L. Britton, Denver, Colo.

47,875. Vehicle tire. J. Christy, Cleveland, assignor to The Portage Rubber Co., Barberton—both in Ohio.

47,876. Vehicle tire. J. Christy, Cleveland, assignor to The Portage Rubber Co., Barberton—both in Ohio.

47,877. Deflating implement. C. E. Delaplain, Jacksonville, Ill.

47,890. Vehicle wheel tire. E. C. May, Edmonton, Alberta, Canada.

47,892. Tread for tire. J. Hauvette-Michelin, New Brunswick, assignor to Michelin Tire Co., Milltown—both in New Jersey.

47,933. Rubber shoe. F. E. Payne, assignor to The Goodyear Rubber Co.—both of Middletown, Conn.

47,944. Tire. H. C. Arnold, Malden, Mass.

47,947. Tire casing. J. H. Christian, Detroit, Mich.

47,963. Rubber tire tread. N. J. and F. Mooney—both of San Francisco, Cal.

47,969. Tire tread. D. Spence, Norwalk, Conn.

47,972. Tire tread. R. F. Teall, assignor to The Toledo Ford-Tire Co.—both of Toledo, Ohio.

RUBBER INDUSTRY IN NICARAGUA.

For a long time rubber gathering was the chief resource of eastern Nicaragua, but this industry was very injuriously affected by the development of Far Eastern plantations and the consequent fall in rubber prices. The lower cost of plantation rubber finally ruined the Nicaraguan industry, though it was not until 1913 and 1914 that this trade was seriously affected. Up to that time it is estimated that as many as 4,000 workers were engaged in gathering rubber on the eastern coast of Nicaragua. The average result of a day's labor was from four to five pounds per man, for which the laborer received 40 cents gold per pound. In 1914 practically all of this labor was left unemployed and the merchants lost their principal means of establishing foreign credit balances. In 1910, the exports of crude rubber from Nicaragua amounted in value to \$280,876; in 1911, to \$214,960; in 1912, to \$207,748; in 1913, to \$96,471; while in 1914, these exports only amounted to \$48,776. In 1910 prices were as high as \$1.30 per pound. Today they vary from 18 to 25 cents per pound.

Review of the Crude Rubber Market.

NEW YORK.

OCTOBER 30, 1915.

A FAIRLY good business was done in spot and December-January futures during October. Prices did not change materially. First latex spot sold for 61 cents, and Upriver fine for 54½ cents on the first of the month. On October 30 First latex was 61½ cents and Upriver fine 58½ cents.

The announcement of the new Ceylon export tax only resulted in minor and temporary fluctuations. The impression is that the other rubber producing colonies in the Far East will not impose a new tax on rubber exports.

The unstable condition of exchange had a tendency to lower values, but this was overcome by the firmness of the market. Future buying has been mostly confined to January-March deliveries and therefore orders for the greater part of next year's supplies are yet to be placed. This condition is caused by the small difference in present prices for forward sales. On October 29, First latex, January-March delivery, was 59½ cents, and January-June delivery, 59½ cents.

The future of Singapore as an important rubber market now seems assured. The large rubber manufacturers and dealers are establishing offices or agencies in that city. It is significant that in August 2,110 tons of rubber arrived in New York, shipped direct from Singapore and Colombo, while shipments from London and Liverpool were 1,996 tons for the same period.

The steamship "Indrawaddy," sailing from Singapore direct to New York with 1,000 tons of rubber, put in at Colombo with fire in her hold. She is expected to arrive in New York, November 20, three weeks late. The Booth steamship "Denis" from Pará and Manóas with 180 tons is now due. The Lloyd Brasileiro steamship "Rio de Janeiro" from Pará, was due October 30, with 235 tons.

Shipments of rubber invoiced through the American Consul at London for the United States during the nine months ending September 30, 1915, were valued at \$43,080,562, compared with \$25,303,056 for the same period in 1914.

LONDON.

The market for the first week in October was active, due to American buying, and prices advanced. Spot and October crépe brought 2s. 6d. Smoked sheet 2s. 5½d., and hard fine Pará was quoted at 2s. 5d. November-December crépe was marked 2s. 5¼d., and January-June, 1916, 2s. 4¾d.

The market continued quiet with prices steady, supported by moderate buying. On October 21, spot crépe and smoked sheet ribbed were both quoted at 2s. 4¾d.; November-December, 2s. 4½d.; January-June, 2s. 4¼d.

Forward contracts for delivery in 1916 are going at 2s. 2d. (52.7 cents) and 2s. 4d. (56.7 cents) and it is reported that a large number of sales covering the greater part of next year have been made on the basis of these figures. Such contracts have been made with the planters, shipments to be made direct to New York.

MANAOS.

The general demand at this point is good and the market is steady. Stocks are not accumulating as might be expected at this time of year. Apparently there has been heavy selling of futures. Upper Cauchó ball is in good demand at firm prices. July and August, generally quiet months, showed unusual arrivals. The receipts are expected to continue in good volume until the close of the present year. Under these circumstances prices are not expected to advance unless stimulated by European demand.

BATAVIA, JAVA.

Private auctions were held at Batavia on August 17, Septem-

ber 17 and October 18. No. 1 crépe brought 61 cents per pound. Private auctions will be held on November 19 and December 17.

SINGAPORE.

At the auction held on September 1, 1915, 234 tons were offered and 176 tons changed hands. Pale crépe and ribbed sheet sold for \$131 [\$73.36 United States currency] and \$129 [\$72.24 United States currency] respectively per picul (133½ pounds).

At the auction held on September 8, 225 tons were offered and 155 tons sold. There was a demand for Pale crépe which readily brought \$133 [\$74.48 United States currency] per picul.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and October 30, the current date:

PARA.	Nov. 1, '14.	Oct. 1, '15.	Oct. 30, '15.
Upriver, fine, new.....	53 @ 66	54½ @ 55	56 @ 57
Upriver, fine, old.....	67 @ 69	50 @ 52	57 @ 58
Islands, fine, new.....	50 @ 52	50 @ 51	54 @ 55
Islands, fine, old.....	52 @ 53	52 @ 53	55 @ 56
Upriver, coarse, new.....	47 @ 48	41½ @ 42	44 @ 44½
Upriver, coarse, old.....	47 @ 48	43 @ 45	45 @ 46
Islands, coarse, new.....	27 @ 28	26 @ 27	27 @ 27½
Islands, coarse, old.....	30 @ 31	27½ @ 28	28 @ 29
Cameta.....	30 @ 31	27½ @ 28	28 @ 29
Cauchó, ball, upper.....	46 @ 47	42½ @ 43	44 @ 45
Cauchó, ball, lower.....	41 @ 43	40 @ 41	42 @ 43

PLANTATION HEVEA.	Nov. 1, '14.	Oct. 1, '15.	Oct. 30, '15.
Smoked sheet ribbed.....	65 @ 66	59½ @ 60	{ Spot.....61½ @ 62 Jan.-June.60 @ 60½
First latex crépe { Near by.....	61 @ 63	59½ @ 60	{ Spot.....61½ @ 62 Jan.-June.60 @ 60½
{ Forward.....	60 @ 61		
Fine sheets and biscuits, unsmoked.....	60 @ 61	57 @ 57½	58 @ 58½

CENTRAIS.	Nov. 1, '14.	Oct. 1, '15.	Oct. 30, '15.
Corinto.....	45 @ 46½	39 @ 40	41 @ 42
Esmeralda, sausage.....	44 @ 45	38½ @ 39	41 @ 42
Nicaragua, scrap.....	44 @ 45	38½ @ 39	40 @ 41
Mexican plantation, sheet.....	37 @ 39		
Mexican, scrap.....	40 @ 42	39 @ 40	42 @ 43
Mexican, slab.....			30 @ 31
Manoaba.....	38 @ 39	31 @ 32	32 @ 33
Mangabeira, sheet.....	40 @ 42	32 @ 38	32 @ 38
Guayule.....		26 @ 30	32½ @ 33
Balata, sheet.....	51 @ 52	51 @ 52	52½ @ 53
Balata, block.....	43 @ 44	43 @ 44	44 @ 45

AFRICAN.	Nov. 1, '14.	Oct. 1, '15.	Oct. 30, '15.
Lopori, ball, prime.....	52 @ 55	52 @ 53	53 @ 54
Upper Congo, ball, red.....		50 @ 52	52 @ 54
Nassai, red.....	54 @ 58	51 @ 52½	52 @ 54
Soudan Niggers.....		44 @ 45	
Cameroon, ball.....	44 @ 45		
Benguela.....	31 @ 33	31 @ 32	32 @ 33
Acry, fake.....	25 @ 26	24 @ 25	
Rio Nunez Niggers.....		53 @ 53½	53 @ 54
Konakry Niggers.....		51 @ 52	53 @ 54

EAST INDIAN.	Nov. 1, '14.	Oct. 1, '15.	Oct. 30, '15.
Assam.....	54 @ 58	45 @ 47	47 @ 48
Pontianak.....	8 @ 9	6½ @ 7	6½ @ 7
Gutta Siak.....		11½ @ 12	11½ @ 12
Borneo II.....	35 @ 36		
Gutta Percha.....		2.00 @ 2.40	2.50 @ 2.60

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows:

"The demand for commercial paper has continued good through October, as for several months past, and the best rubber names have been taken freely at 4@4½ per cent, and those not so well known 5@5½ per cent, the latter mostly by out-of-town banks."

NEW YORK PRICES FOR SEPTEMBER (NEW RUBBER).

	1913.	1914.	1915.
Upriver, fine.....	\$0.80 @ 0.90	\$0.64 @ 0.78	\$0.55 @ 0.57
Upriver, coarse.....	.48 @ .52	.43 @ .55	.41 @ .43
Islands, fine.....	.71 @ .77	.53 @ .70	.49 @ .51
Islands, coarse.....	.22 @ .31	.20 @ .35	.20 @ .27
Cameta.....	.36 @ .39	.29 @ .36	.28 @ .30

IMPORTS FROM PARA AT NEW YORK.

(The Figures Indicate Weight in Tons.)

SEPTEMBER 23.—By the steamer *Aere* from Pará:

	Time.	Medium.	Cause.	Cause.	Total.
Meyer & Brown	70,200	1,900	26,400	35,900	134,200
Henderson & Korn	195,300	1,900	2,200	2,200	199,600
Arnold & Zeiss	106,900	16,900	11,300	7,100	142,100
Seuss, Hesslin & Co.	41,300	.....	.....	.....	41,300
H. A. Aslett & Co.	600	2,300	10,100	5,100	16,100
Muller, Schall & Co.	4,800	.....	.....	.....	4,800
General Rubber Co.	3,400	300	100	.....	3,800
W. R. Grace & Co.	1,400	.....	.....	.....	1,400
Total	227,800	16,700	52,700	55,500	352,500

OCTOBER 2.—By the steamer *Francis* from Pará and Manáos:

	Time.	Medium.	Cause.	Cause.	Total.
Meyer & Brown	20,900	5,600	67,200	23,100	116,800
Arnold & Zeiss	34,100	2,500	46,000	5,700	88,300
H. A. Aslett & Co.	26,300	3,500	17,700	22,500	70,300
G. Amsinck & Co.	32,300	1,000	7,800	.....	41,100
Henderson & Korn	1,800	4,500	29,900	4,300	40,400
J. T. Johnston & Co.	.....	700	17,200	2,500	38,700
Robert Baldwin	2,500	.....	700	.....	3,200
General Rubber Co.	1,300	100	3,100	.....	4,500
Aldens' Successors, Ltd.	700	700	2,700	.....	4,100
Total	124,900	18,900	192,300	77,000	413,100

OCTOBER 13.—By the steamer *Atahualpa*, from Iquitos:

	Fine.	Medium.	Cause.	Cause.	Total.
Meyer & Brown	9,700	1,100	3,100	17,600	31,500
H. Kupper	49,000	800	10,000	28,300	88,100
W. R. Grace & Co.	29,700	400	9,300	8,500	47,900
H. A. Aslett & Co.	24,800	1,200	3,200	9,100	38,300
G. Amsinck & Co.	7,200	.....	2,500	5,100	14,800
Rumsey & Greutert Co., Inc.	2,900	.....	900	1,300	5,100
Chartered Bank of Spanish America	2,100	.....	300	.....	2,400
Total	125,400	3,500	29,300	69,900	228,100

PARA RUBBER VIA EUROPE.

	POUNDS.
SEPTEMBER 25.—By the <i>Advance</i> =Colon:	
G. Amsinck & Co. (Caucho).....	9,500
W. R. Grace & Co. (Fine).....	5,000
W. R. Grace & Co. (Coarse).....	7,000
Total	21,500

OCTOBER 4.—By the <i>Metana</i> =Bolívar:	
Yglesias, Lobo & Co. (Fine).....	25,000
Yglesias, Lobo & Co. (Coarse).....	10,000
Total	35,000

OCTOBER 13.—By the <i>Colon</i> =Colon:	
G. Amsinck & Co. (Caucho).....	36,000
Total	36,000

OCTOBER 13.—By the <i>Hesperides</i> =Montevideo:	
Rubber & Guayule Agency, Inc. (Fine).....	16,000
Total	16,000

Rubber & Guayule Agency, Inc. (Coarse).....	5,000
G. Amsinck & Co. (Fine).....	2,000
Total	21,000

OCTOBER 23.—By the <i>Interocean</i> =Colon:	
Meyer & Brown (Fine).....	61,300
Meyer & Brown (Medium).....	5,900
Meyer & Brown (Coarse).....	3,100
Meyer & Brown (Caucho).....	2,100
General Rubber Co. (Coarse).....	2,600
Aldens' Successors, Ltd. (Medium).....	1,600
Aldens' Successors, Ltd. (Coarse).....	600
Total	77,100

CENTRALS.

[*This sign, in connection with imports of Centrals, denotes Guayule rubber.]

SEPTEMBER 24.—By the <i>Santa Maria</i> =Cartagena:	
G. Amsinck & Co. (Caucho).....	5,500
Total	5,500

SEPTEMBER 25.—By the <i>Advance</i> =Colon:	
G. Amsinck & Co. (Caucho).....	7,500
Lawrence Johnson & Co. (Medium).....	2,700
Dumarest Bros. (Coarse).....	1,000
Pico, Nephews & Co. (Fine).....	8,000
Porter, Hurling & Co. (Coarse).....	1,500
Total	20,700

SEPTEMBER 25.—By the <i>San Jacinto</i> =Galveston:	
Various	*60,000
Total	60,000

SEPTEMBER 25.—By the <i>Santiago</i> =Mexico:	
American Trading Co. (Caucho).....	21,000
Harburger & Stock.....	3,000
G. Amsinck & Co. (Caucho).....	1,500
J. Sembrada & Co. (Caucho).....	500
H. Marquardt & Co. (Caucho).....	500
Total	26,500

SEPTEMBER 27.—By the <i>Morro Castle</i> =Mexico:	
Lawrence Johnson & Co. (Caucho).....	20,000
Various	1,000
Total	21,000

SEPTEMBER 27.—By the <i>Byron</i> =Bahia:	
Adolph Hirsch & Co. (Caucho).....	110,000
Total	110,000

OCTOBER 13.—By the steamer *Atahualpa*, from Pará and Manáos:

	Time.	Medium.	Cause.	Cause.	Total.
Meyer & Brown	117,500	16,200	60,400	39,800	234,300
Arnold & Zeiss	109,200	9,600	25,400	95,100	249,900
General Rubber Co.	124,900	16,100	41,500	4,400	186,800
R. L. & Co.	247,500	.....	20,200	.....	168,100
H. A. Aslett & Co.	85,700	7,400	42,000	.....	136,400
Henderson & Korn	46,100	9,700	1,500	18,000	72,300
Adolph Hirsch & Co.	1,300	.....	.....	.....	21,800
H. Amsinck & Co.	.....	.....	.....	.....	13,200
Aldens' Successors, Ltd.	.....	.....	.....	.....	14,300
Cowdrey & Co.	.....	.....	.....	.....	10,200
Total	674,000	59,700	210,400	171,900	1,116,000

OCTOBER 18.—By the steamer *Seigie*, from Pará:

	Fine.	Medium.	Cause.	Cause.	Total.
Meyer & Brown	42,800	3,200	35,000	15,700	96,700
Arnold & Zeiss	107,500	9,900	32,800	15,000	165,200
H. A. Aslett & Co.	19,700	20,600	75,500	13,000	129,100
J. T. Johnston & Co.	58,100	5,400	30,000	.....	93,500
General Rubber Co.	32,100	6,300	13,200	3,400	55,000
Neuss, Hesslin & Co.	23,700	.....	4,000	19,700	47,400
G. Amsinck & Co.	26,400	1,400	8,000	1,300	37,100
W. R. Grace & Co.	7,700	.....	2,500	10,000	20,200
W. G. Ryckman	12,100	.....	.....	.....	12,100
Aldens' Successors, Ltd.	.....	3,500	3,900	.....	7,400
Total	330,300	50,300	204,900	78,400	663,900

OCTOBER 15.—By the *Carrillo*=Cartagena:

	POUNDS.
International Banking Corporation	1,000
G. Amsinck & Co.	200
Total	1,200

OCTOBER 18.—By the *Monas*=New Orleans:

	POUNDS.
A. N. Rotholz	4,000
Total	4,000

OCTOBER 18.—By the *Siracusa*=Cortez:

	POUNDS.
A. Rosenthal & Sons	3,500
Egges & Heisler	1,000
J. S. Sembrada & Co.	800
G. Amsinck & Co.	300
R. G. Barthold	100
Total	5,700

OCTOBER 19.—By the *Tenacore*=Port Limon:

	POUNDS.
A. A. Linde & Co.	1,200
A. Held	300
Total	1,500

OCTOBER 10.—By the *Terence*=Bahia:

	POUNDS.
Adolph Hirsch & Co.	12,000
Total	12,000

OCTOBER 19.—By the *Esperanza*=Mexico:

	POUNDS.
H. Marquardt & Co.	4,000
J. A. Medina	3,000
Graham, Hinkley & Co.	500
Lawrence Johnson & Co.	300
Total	7,800

OCTOBER 21.—By the *Santa Maria*=Cartagena:

	POUNDS.
G. Amsinck & Co.	3,000
Total	3,000

OCTOBER 23.—By the *Advance*=Colon:

	POUNDS.
Lawrence Johnson & Co.	9,400
G. Amsinck & Co.	3,700
Total	13,100

OCTOBER 23.—By the *Concho*=Galveston:

	POUNDS.
Various	*56,000
Total	56,000

AFRICANS.

SEPTEMBER 23.—By the *St. Cecilia*=London:

	POUNDS.
General Rubber Co.	12,500
Total	12,500

SEPTEMBER 27.—By the *Mississippi*=London:

	POUNDS.
Henderson & Korn	11,200
Total	11,200

SEPTEMBER 27.—By the *Idaha*=Hull:

	POUNDS.
Aldens' Successors, Ltd.	80,000
Total	80,000

OCTOBER 4.—By the *Agamemnon*=Lisbon:

POUNDS.

OCTOBER 6.—By the *Norseman*—Liverpool:
 Rubber Trading Co.,..... 21,000
 Various..... 1,500 23,500

OCTOBER 11.—By the *Géorgie*—Liverpool:
 Aldens' Successors, Ltd.,..... 70,000
 Henderson & Korn..... 12,000 82,000

OCTOBER 21.—By the *Ostania*—Liverpool:
 Robert Badenhop..... 13,500

EAST INDIAN.

[*Denotes plantation rubber.]

SEPTEMBER 23.—By the *M. Cecilia*—London:
 General Rubber Co.,..... *360,000
 The B. F. Goodrich Co.,..... *325,000
 L. Littlejohn & Co.,..... *132,349
 Aldens' Successors, Ltd.,..... *35,000
 Rubber Trading Co.,..... *35,000
 J. T. Johnstone & Co.,..... *33,500
 Robinson & Co.,..... *11,200
 Various..... *2,671 *934,700

SEPTEMBER 25.—By the *City of Naples*—Singapore:
 L. Littlejohn & Co.,..... *159,680
 Henderson & Korn..... 160,000
 General Rubber Co.,..... *175,000
 Arnold & Zeiss..... 25,000
 Charles T. Wilson Co., Inc.,..... *45,000
 Robert Badenhop..... *45,000
 Hood Rubber Co.,..... *5,500
 Edward Maurer & Co., Inc.,..... *13,500
 Goodyear Tire & Rubber Co.,..... *90,000
 The B. F. Goodrich Co.,..... *200,000
 Various..... *85,320 *1,004,000

SEPTEMBER 27.—By the *Kuerner*—Colombo:
 Meyer & Brown..... *125,000
 L. Littlejohn & Co.,..... *104,390
 General Rubber Co.,..... *22,500
 J. T. Johnstone & Co.,..... 30,000
 W. R. Grace & Co.,..... *13,500
 Arnold & Zeiss..... *50,000
 W. H. Stiles..... *40,000
 Henderson & Korn..... *30,000
 Various..... *88,610 *504,000

SEPTEMBER 27.—By the *City of Bristol*—Singapore:
 Arnold & Zeiss..... *45,000
 L. Littlejohn & Co.,..... *232,600
 Henderson & Korn..... *130,000
 Core & Herbert..... *33,500
 Rumsey & Greutert Co., Inc.,..... *56,000
 W. R. Grace & Co.,..... *11,200
 J. T. Johnstone & Co.,..... *50,000
 The B. F. Goodrich Co.,..... *530,000
 Goodyear Tire & Rubber Co.,..... *50,000
 General Rubber Co.,..... *11,200
 Aldens' Successors, Ltd.,..... *2,200
 Various..... *67,400 *1,219,100

SEPTEMBER 30.—By the *St. Patrick*—Colombo:
 Meyer & Brown..... *52,000
 L. Littlejohn & Co.,..... *67,730
 General Rubber Co.,..... *105,000
 Arnold & Zeiss..... *14,000
 Goodyear Tire & Rubber Co.,..... *17,700
 Various..... *8,700 *264,500

OCTOBER 1.—By the *Ternate*—Batavia:
 Meyer & Brown..... *85,000
 Aldens' Successors, Ltd.,..... *100,000
 Rubber Trading Co.,..... *22,500
 G. Amsinck & Co.,..... *20,000
 General Rubber Co.,..... *9,000
 Edward Maurer & Co., Inc.,..... *115,000
 J. T. Johnstone & Co.,..... *10,000
 Manhattan Rubber Manufacturing Co.,..... *27,500
 Goodyear Tire & Rubber Co.,..... *90,000
 L. Littlejohn & Co.,..... *7,733
 Various..... *642,267 *1,214,500

OCTOBER 4.—By the *Edgelyfe*—London:

General Rubber Co.,..... *290,000
 The B. F. Goodrich Co.,..... *260,000
 L. Littlejohn & Co.,..... *12,949
 J. T. Johnstone & Co.,..... *22,500
 Charles T. Wilson Co., Inc.,..... *22,500
 Robert Badenhop..... *22,500
 Rubber Trading Co.,..... *13,000
 Arnold & Zeiss..... *6,700
 Robinson & Co.,..... *22,500
 Aldens' Successors, Ltd.,..... *4,500
 Rumsey & Greutert Co., Inc.,..... *3,500 *680,649

OCTOBER 7.—By the *Saron Monarch*—London:

General Rubber Co.,..... *60,000
 Aldens' Successors, Ltd.,..... *180,000
 The B. F. Goodrich Co.,..... *315,000
 L. Littlejohn & Co.,..... *169,152
 Charles T. Wilson Co., Inc.,..... *45,000
 Rubber Trading Co.,..... *45,000
 Edward Maurer & Co., Inc.,..... *30,000
 J. T. Johnstone & Co.,..... *6,500
 Rumsey & Greutert Co., Inc.,..... *6,500 *857,152

OCTOBER 8.—By the *Egremont Castle*—Singapore:

Henderson & Korn..... *325,000
 L. Littlejohn & Co.,..... *359,160
 General Rubber Co.,..... *300,000
 The B. F. Goodrich Co.,..... *112,000
 Charles T. Wilson Co., Inc.,..... *45,000
 W. R. Grace & Co.,..... *70,000
 Robert Badenhop..... *22,500
 W. R. Grace & Co.,..... *50,000
 Hood Rubber Co.,..... *5,000
 Goodyear Tire & Rubber Co.,..... *75,000
 J. T. Johnstone & Co.,..... *15,000
 Various..... *150,840 *1,529,500

OCTOBER 8.—By the *City of Baroda*—Colombo:

Meyer & Brown..... *302,000
 L. Littlejohn & Co.,..... *220,130
 J. H. Stiles..... *100,000
 J. T. Johnstone & Co.,..... *30,000
 W. R. Grace & Co.,..... *12,500
 Hood Rubber Co.,..... *25,000
 Henderson & Korn..... *60,000
 Robinson & Co.,..... *70,000
 Arnold & Zeiss..... *170,000
 Various..... *29,870 *1,019,500

OCTOBER 8.—By the *Launceston*—Liverpool:

Goodyear Tire & Rubber Co.,..... *30,000

OCTOBER 9.—By the *Aschendale*—London:

Goodyear Tire & Rubber Co.,..... *112,000
 Edward Maurer & Co., Inc.,..... *13,500 *125,500

OCTOBER 11.—By the *Saudon Hall*—Colombo:

Meyer & Brown..... *90,000
 General Rubber Co.,..... *22,500
 L. Littlejohn & Co.,..... *150,240
 Arnold & Zeiss..... *70,000
 Henderson & Korn..... *55,000
 W. R. Grace & Co.,..... *11,200
 J. T. Johnstone & Co.,..... *22,500
 W. H. Stiles..... *12,000
 Goodyear Tire & Rubber Co.,..... *6,000
 Rubber Trading Co.,..... *45,000
 Various..... *19,760 *504,200

OCTOBER 14.—By the *Queen Margaret*—London:

The B. F. Goodrich Co.,..... *480,000
 General Rubber Co.,..... *425,000
 Arnold & Zeiss..... *80,000
 L. Littlejohn & Co.,..... *132,499
 J. T. Johnstone & Co.,..... *60,000
 Edward Maurer & Co., Inc.,..... *60,000
 Rubber Trading Co.,..... 10,000
 Robinson & Co.,..... *33,500
 W. H. Stiles..... *33,500
 Rubber & Guayule Agency, Inc.,..... *20,000
 Aldens' Successors, Ltd.,..... *6,700
 Various..... *25,000 *1,366,199

OCTOBER 20.—By the *Prometheus*—Batavia:

Meyer & Brown..... *95,000
 Edward Maurer & Co., Inc.,..... *112,000
 General Rubber Co.,..... *315,000
 Goodyear Tire & Rubber Co.,..... *70,000
 Manhattan Rubber Manufacturing Co.,..... *30,000
 G. Amsinck & Co.,..... *11,200
 Rubber Trading Co.,..... *120,000
 J. T. Johnstone & Co.,..... *7,000
 L. Littlejohn & Co.,..... *23,860
 Various..... *371,920 *1,160,200

OCTOBER 21.—By the *Ayerre*—Colombo:

Meyer & Brown..... *11,200
 L. Littlejohn & Co.,..... *208,340
 Arnold & Zeiss..... *60,000
 Henderson & Korn..... *17,000
 W. H. Stiles..... *55,000
 Goodyear Tire & Rubber Co.,..... *8,000 *359,540

OCTOBER 21.—By the *Argonne*—London:

Meyer & Brown..... *22,600
 Edward Maurer & Co., Inc.,..... *25,000
 Goodyear Tire & Rubber Co.,..... *34,470 *3,793
 General Rubber Co.,..... *135,000
 Charles T. Wilson Co., Inc.,..... *11,200
 L. Littlejohn & Co.,..... *33,400 *277,200

OCTOBER 23.—By the *Tronto*—London:

Meyer & Brown..... *27,000
 Aldens' Successors, Ltd.,..... *27,000
 The B. F. Goodrich Co.,..... *150,000
 J. T. Johnstone & Co.,..... *131,660
 L. Littlejohn & Co.,..... *105,000
 General Rubber Co.,..... *67,000
 Arnold & Zeiss..... *17,000
 Rubber Trading Co.,..... *10,000
 Michelin Tire Co.,..... *10,000
 Rumsey & Greutert Co., Inc.,..... *7,500
 Various..... *30,500 *571,160

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK—AUGUST, 1915.

Imports:	Pounds.	Value.
India rubber.....	16,286,888	\$8,140,861
Balata.....	31,470	\$3,793
Gutta percha.....	134,698	15,278
Gutta jelutong (Pontianak).....	1,276,088	57,041
Total.....	18,011,144	\$8,331,973

Exports:	Pounds.	Value.
Balata.....	35,022	\$13,258
Rubber scrap.....	110,014	12,789
Total.....	145,036	\$26,047

PORT OF NEW YORK—SEPTEMBER, 1915.

Imports:	Pounds.	Value.
India rubber.....	19,326,573	\$9,718,540
Balata.....	73,885	29,457
Gutta percha.....	399,408	43,760
Gutta jelutong (Pontianak).....	4,155,120	155,808
Rubber scrap.....	431,046	40,427
Total.....	24,386,032	\$9,987,992

Exports:	Pounds.	Value.
Balata.....	45,487	\$19,079
Rubber scrap.....	134,993	18,433
Total.....	180,480	\$37,512

PORT OF CHICAGO—SEPTEMBER, 1915.

Imports:	Pounds.	Value.
Rubber scrap.....	64,979	\$3,780

PORT OF CLEVELAND—SEPTEMBER, 1915.

Imports:	Pounds.	Value.
Rubber scrap.....	289	\$15

Exports:	Pounds.	Value.
Rubber reclaimed.....	40,000	\$2,038

PORT OF DETROIT—SEPTEMBER, 1915.

Exports:	Pounds.	Value.
Rubber scrap.....	6,016	\$296
Rubber reclaimed.....	11,084	2,896
Total.....	17,100	\$3,192

PORT OF NIAGARA FALLS—SEPTEMBER, 1915.

Exports:	Pounds.	Value.
India rubber.....	103,777	\$53,731
Rubber scrap.....	44,700	1,851
Total.....	148,477	\$55,582

PORT OF NEW ORLEANS—SEPTEMBER, 1915.

Imports:	Pounds.	Value.
India rubber.....	251,361	\$83,680

Plantation Rubber from the Far East.

TOTAL EXPORTS FROM MALAYA.

(From January to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	Singapore.	Malacca.	Penang.	Port Swet.	Penang.	Total.
Great Britain.....	18,948,840	5,346,805	13,272,198	20,144,518	57,712,361	
Continent.....	3,094,414	.....	676,132	29,160	3,799,706	
Japan.....	1,066,849	.....	.....	.....	1,066,849	
Ceylon.....	129,381	.....	338,666	1,111,650	1,580,697	
United States.....	16,560,397	.....	755,000	.....	17,315,397	
Australia.....	242,459	.....	.....	.....	242,459	
Total.....	40,042,540	5,346,805	15,031,996	21,276,338	81,697,669	
Same period, 1914.....	24,175,230	3,234,581	11,521,466	20,637,311	59,568,588	
Same period, 1913.....	13,938,262	.....	8,222,533	19,946,488	42,107,283	
Same period, 1912.....	7,018,784	.....	4,798,834	14,057,852	25,875,470	

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to September 20, 1914 and 1915. Compiled by the Ceylon Chamber of Commerce.)

To—	1914.	1915.
Great Britain.....	13,941,015	17,187,885
United States.....	6,240,667	10,919,268
Belgium.....	2,969,369	.....
Germany.....	1,037,415	.....
France.....	48,264	518,937
Japan.....	28,072	379,87
Russia.....	215,100	236,251
Straits Settlements.....	105,312	152,200
Italy.....	42,535	119,933
India.....	1,772	.....
Canada and Newfoundland.....	1,050	1,000
Total.....	23,981,881	30,079,486

(Same period 1913, 17,188,348 pounds; same period, 1912, 8,594,090.)
The export figures of rubber given in the above table for 1914 include the imports re-exported. (These amount to 2,782,475 pounds.) To arrive at the total quantity of Ceylon rubber exported for that period deduct these imports from the total exports. The figures for 1915 are for Ceylon rubber only.

SINGAPORE.

Guthrie & Co., Ltd., report (September 15, 1915):

The rubber auction held to-day opened quietly and bidding throughout was somewhat irregular.

Fine pale crepe again sold readily and for one lot \$132 was paid. Fine ribbed smoked sheet was \$1 down at \$128 and few lots reached this price, the average being about \$127.25. Unsmoked sheet in very good demand, all parcels being eagerly snapped up from \$117/119.

The lower grades marked an average decline of 4¢, demand for these being slow.

Of 201 tons offered, 127 tons changed hands.

The following was the course of values:

	In Singapore.	Sterling equivalent per pound in London.	Equivalent per pound in cents.
Sheet, fine ribbed smoked.....	\$125 @ 128	2/ 5 1/4 @ 2/ 5 1/2	59.29 @ 60.56
Sheet, fair to good ribbed smoked.....	124 @ 124	2/ 4 1/4 @ 2/ 5	58.53 @ 58.79
Sheet, plain, smoked.....	115 @ 121	2/ 3 1/4 @ 2/ 4 1/4	54.98 @ 57.52
Sheet, unsmoked.....	112 @ 119	2/ 2 1/2 @ 2/ 4	53.72 @ 56.76
Crepe, fine pale.....	126 @ 132	2/ 3 1/2 @ 2/ 6 1/4	59.80 @ 62.33
Crepe, good pale.....	125 @	2/ 3 @	59.29
Crepe, fine brown.....	121 @ 124	2/ 4 1/4 @ 2/ 5	57.52 @ 58.79
Crepe, good brown.....	109 @ 120	2/ 1 3/4 @ 2/ 4 1/4	52.45 @ 57.27
Crepe, dark.....	101 @ 107	2/ 0 1/2 @ 2/ 1 1/2	49.16 @ 51.70
Crepe, bark.....	92 @ 106	1/ 10 1/4 @ 2/ 1 1/2	45.35 @ 51.18
Scrap, virgin.....	75 @ 99	1/ 6 1/4 @ 1/ 11 1/4	38.01 @ 48.14
Scrap, loose.....	64 @ 70	1/ 4 1/2 @ 1/ 5 1/4	33.45 @ 35.98

*Picul = 133 1/2 pounds.

Quoted in S. S. dollars = 2/4 [56 cents].

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram, received from Kuala Lumpur, announces that the export of plantation rubber from the Federated Malay States during the month of September amounted to 3,334 tons as compared with 3,796 tons in August and 2,879 tons in the corresponding month last year.

The following is a comparative table showing the export for three years:

	1913.	1914.	1915.
January.....	Tons 2,131	2,542	3,473
February.....	" 1,757	2,364	3,441
March.....	" 1,737	2,418	3,148
April.....	" 1,676	2,151	2,722
May.....	" 1,225	2,069	2,768
June.....	" 2,095	2,306	3,401
July.....	" 1,781	2,971	3,672
August.....	" 2,363	1,850	1,796
September.....	" 2,000	2,879	3,334
Total.....	" 16,625	21,550	30,007

PLANTATION RUBBER EXPORTS FROM MALA AND MALACCA.

	July.	Seven Months Ending July 31.
EXPORTS, Tons.....	1914.	1915.
Holland.....	1,144	4,704
France.....	292,600	468,600
Hevea.....	79,790	1,786,400
Manihot.....	19,944	466,200
Castilla.....	9,075	125,279
Total.....	4,024	41,958
Great Britain.....	392,963	483,013
Continent.....	977	2,440,013
Hevea.....	13,302	1,805,507
Manihot (cocoa).....	336,600	39,180
Castilla.....	980	2,822,600
Total.....	1,375	27,854
Belgium.....	139,932	5,808
France.....	614,809	20,896
Hevea.....	2,000	2,037,333
United States.....	2,200	462
Manihot (cocoa).....	928,400	582,400
Total.....	125,400	582,400
France.....	2,200	6,600
United States.....	2,200	90,200
Manihot (cocoa).....	928,400	4,087,600
Total.....	2,200	4,087,600
Germany.....	17,600	79,200
Castilla.....	2,200	2,200
Total.....	17,600	81,400
Singapore.....	50,600	3,344
Hevea.....	50,600	1,043
Manihot (cocoa).....	2,200	352,000
Total.....	50,600	260
Japan.....	60,544	165,588
Hevea.....	17,600	364,643
Other Countries.....	120	214,000
Hevea.....	120	539
Total.....	120	87,800
Grand Total.....	930,895	2,104,546

THE RUBBER SCRAP MARKET.

OCTOBER 30, 1915.

THE New York market developed considerably activity early in October, due to the spirited trading in boots and shoes. It was apparently a trader's market, which the mills refused to support with substantial orders. Prices asked for boots and shoes were 8 1/2 cents delivered. All other grades were inactive and prices unchanged.

The interest in boots and shoes continued during the month despite the lack of large buying orders from the mills. The price level was evidently too high, and consumers preferred to wait for better prices. However, actual transactions were made at 8 1/2 cents.

The rest of the list has not developed unusual interest. There are excessive stocks of auto, tires, and prices are therefore easier. Solid and bicycle tires, which have been slow for several months, are firmer. There appears to be a surplus of white tires, resulting in lower prices. Tubes are firmer, and a good buying demand is anticipated by holders of tube stocks. No change has been noted in the other grades of scrap, although hose is receiving fair attention and prices are holding their own.

NEW YORK QUOTATIONS FOR CARLOAD LOTS.

October 30, 1915.

	Per Pound.
Boots and shoes.....	\$0.08 1/2 @ 0.08 1/2
Trimmed auto.....	0.08 @ 0.07
White auto, No. 1.....	0.06 1/2 @ 0.07
Auto tires, mixed.....	0.05 @ 0.05
Auto tires, striped, magnata feed.....	0.05 @ 0.05
Solid tires, No. 1.....	0.04 @ 0.04
Inner tubes, No. 1.....	0.04 @ 0.04
Inner tubes, No. 2.....	0.03 @ 0.03
Red.....	0.03 @ 0.03
Bicycle tires.....	0.03 @ 0.03
Iron tire scrap.....	0.01 1/2 @ 0.02
Auto peelings, No. 1.....	0.08 @ 0.09
Auto peelings, No. 2.....	0.06 1/2 @ 0.07
White scrap, No. 1.....	0.06 @ 0.07
White scrap, No. 2.....	0.05 @ 0.06
Red scrap, No. 1.....	0.04 @ 0.05
Mixed black scrap.....	0.03 @ 0.04
Rubber car springs.....	0.03 @ 0.04
Horse shoe pads.....	0.03 @ 0.04
Mattings and packing.....	0.03 @ 0.04
Garden hose.....	0.03 @ 0.04
Art brake hose.....	0.03 @ 0.04
Large hose.....	0.01 @ 0.02

MARKET FOR COTTON AND OTHER FABRICS.

THE heavy decline in the condition of the cotton crop, shown by the government figures, caused substantial advances during the first week of October. The estimated yield of 10,950,000 bales will be the smallest crop since 1909. As the month progressed there was less activity and later in the month prices declined from 23 to 24 points, due to heavy liquidation and southern selling. At this writing the decline appears to be checked.

SEA ISLAND COTTON.

The sharp advance in Sea Islands early in October was evidently speculative. This developed a strong market with a tendency to advance. By the middle of the month, however, a more quiet feeling prevailed, due to the less urgent demand and Savannah prices declined.

The Charleston market was quiet during the last week of the month, and it was believed that fair concessions must be made, but contrary to expectations all offerings were promptly sold at full prices. Floridas and Georgias: Fancy, 25½@26 cents; Extra choice, 25 cents; Choice, 24 cents.

EGYPTIAN COTTON.

The latest reports from Alexandria show a steady market and advancing prices, with spot very active and a good demand for all grades. Upper are offered at attractive figures, and Sakelarides is still at a very high premium. There are general complaints of damage to the coming crop by foggs and Pink worms which would augur a small production for next year. The ginning yields are slightly less than last year at this time.

FABRICS.

The advance in prices of cotton fabrics has been general. The mills are speeding up and buyers who have delayed in placing their orders are now forced to pay higher prices.

Tire fabrics have advanced four to six cents and the tendency is for still higher prices. The cotton cloth market is very strong and active and further price advance is expected. The production of hose and belting duck is being absorbed as fast as manufactured and the rubber trade is calling for larger deliveries. The majority of the duck mills report that their product is sold up to next summer.

At the present time the demand for yarn dyed goods is greater than the foreign and domestic markets can take care of. Many of the mills making a specialty of these goods are sold into next June. Some of the larger operators here are now figuring on placing contracts for the fall of 1916. This is done with the view of being able to secure deliveries and of getting the fall orders placed at present prices, which are almost sure to advance.

The following are New York quotations on October 27, 1915:

Warpless and Balloon Fabrics:			
Wamutta, S. A. I. L. No. 1,	40-inch.	yard	\$0.22 @
O/X B.	No. 4, 38½-inch.		.22 @
	36-inch.		.11½ @
Wool Stockinette—53-inch:			
A—14-ounce		yard	1.12½ @
B—14-ounce			1.25 @
C—14-ounce			1.50 @
Cotton Stockinette—53-inch:			
E—14-ounce		yard	.46 @
F—11½-ounce			.36 @
G—12-ounce			.40 @
H—14-ounce			.40 @
I—11-ounce			.45 @
J—9-ounce			.37½ @
Colors—white, black, blue, brown.			
Tire Fabrics:			
17½-ounce	Sea Island, combed.	yard	.68 @
17½-ounce	Egyptian, combed.		.58 @
17½-ounce	Sea Island, carded.		.68 @
17½-ounce	Peelers, carded.		.42 @
Sheetings:			
40-inch	2.5-yard	yard	.09½ @
40-inch	2.56-yard		.0834 @
40-inch	2.70-yard		.0881 @
40-inch	2.85-yard		.077 @
40-inch	2.90-yard		.0713 @

O-nalunags:			
40-inch 2.25-yard	yard	10½ @	1.05
40-inch 2.48-yard	yard	09½ @	.95
37½-inch 2.43-yard	yard	09½ @	.95
Mechanical Ducks:			
Hose .....	.. pound	23½ @	2.45
Beltng .....	..	23½ @	
Carriage Cloth Duck:			
38-inch 2.00-yard enameling duck	yard	12½ @	1.13
38-inch 1.74-yard	yard	13¾ @	1.44
38-inch 1.66-yard	yard	27 @	.73
72-inch 17.21-ounce .....	.. 28	.. 28	.. 1.89
Drills:			
38-inch 2.00-yard	yard	12 @	1.12½
40-inch 2.47-yard	yard	09¾ @	.96
38-inch 2.00-yard	yard	13½ @	1.13
52-inch 1.95-yard	yard	12¾ @	.93
60-inch 1.52-yard	yard	16 @	1.18¾
Yarns:			
Garden Hose 12/2 cabled .....	.. pound	24 @	.64
Pire Hose 12/2 .....	..	22 @	.52
Imported Woolen Fabrics Specially Prepared for			
Rubberizing—Plain and Fancies:			
36-inch, 3¼ to 7½ ounces per square yard	yard	.38 @	1.55
36-inch, 2¾ to 5 ounces per square yard	yard	.35 @	.85
Plaid Linings:			
36-inch, 2 to 4 ounces per square yard	yard	.35 @	.75
36-inch, 2 to 4 ounces per square yard	yard	.20 @	.45
Domestic Warsted Fabrics:			
36-inch, 4½ to 8 ounces per square yard	yard	.20 @	.30
Burlaps:			
32—7½-ounce	100 yards	\$5.15	
40—7½-ounce .....	..	5.25	
40—8-ounce .....	..	5.35	
40—10-ounce .....	..	7.60	
40—10½-ounce .....	..	7.75	
45—7½-ounce .....	..	6.25	
45—8-ounce .....	..	6.35	
48—10-ounce .....	..	10.10	

CANADIAN IMPORTS OF COTTON FABRICS.

ARTICLES	July, 1915.		Four Months Ending July, 1915.	
	General Tariff. Value.	Preferential Tariff. Value.	General Tariff. Value.	Preferential Tariff. Value.
<i>Articles Potable.</i>				
Stockinettes for the manuf. of rubber boots and shoes:				
From Great Britain				\$922
United States	\$6,682		\$19,840	
Cotton Duck, gray or white, N. O. P.:				
From Great Britain		\$2,867		\$10,507
United States	\$18,646		\$80,852	
Other countries			11	
Total	\$18,646	\$2,867	\$80,863	\$10,507
ARTICLES—Free: Cotton or linen seamless duck, in circular form, was imported to the extent of \$5,165 during July, making a total of \$15,131 for the four months ending July, 1915.				

THE MARKET FOR CHEMICALS AND COMPOUND-
ING INGREDIENTS.

OCTOBER 29, 1915.

OCTOBER has been a particularly good month in the rubber chemical trade for both foreign and domestic products. Prices have changed very little, but there is a decided tendency toward higher values. The fillers have been in good demand—particularly the chalk products. Shipments of the raw material are very uncertain, which unsettles the market and makes present prices comparatively high. Barytes is offered for export, which indicates ample supply with consequent low prices.

The pigments have been actively bought during the month. The zinc oxide situation has not improved, and the high prices of last month still rule, subject to change without notice. A new schedule is expected momentarily. Lithopone is firm; spot stocks are low and prices nominal. Vermilion red and Prussian blue are still scarce and high, while Ultramarine blue is normal with a tendency toward firmer prices.

The chemicals are practically all firm in price. Glacial acetic acid has advanced to 21½¢@25 cents a pound in barrels, and glycerine is not obtainable. The naphtha solvents have advanced a cent a gallon, benzol is quoted at 80¢@90 cents, and toluol is firm at \$4.00 to \$4.50 a gallon. All the benzol produced in Great

Britain has been commandeered by the war office and none can be sold or exported. Litharge has been in demand at firm prices, while market quotations on white and red lead have not changed; though sales have been reported at higher figures based on better quality.

The rosin and turpentine markets have been very active and advances have probably reached the limit. Aniline oil is selling at 95 cents to \$1.50 per pound, and pine and rosin oil have advanced.

PRICES OF CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK, OCTOBER 29, 1915.

Acetone (drums).....	lb.	\$0.28	@ \$0.29
Acid, acetic (8 per cent. (bbbls.).....	lb.	3.00	@ 3.15
glacial (carboys).....	lb.	2.15	@ .25
Aluminum Flake (carboys).....	ton	18.00	@ 20.00
Ammonium carbonate.....		None	
Antimony, crimson, sulphuret of (casks).....	lb.	.80	@ .85
golden, sulphuret of (casks).....	ton	19.00	@ 20.00
Asbestos.....	lb.	.04	@ .05
Asphaltum "70" Brilliant.....	lb.	.03	@ .03 1/2
Barium sulphate, precipitated.....	ton	90.00	@ 100.00
Barytes, pure white.....	ton	16.00	@ 20.00
off color.....	ton	12.50	@ 14.00
Bassorin.....	lb.	115.00	m
Benzol, pure.....	gal.	2.00	@ .50
Black Naphthol.....	lb.	2.00	@ 2.50
Black Faxe.....	lb.	.03	@ .03 1/2
Bone ash.....	lb.	.06 1/2	@
black.....	lb.	.06 1/2	@ .07
Cadmium tri-sulphate.....		None	
Castella gum.....	lb.	.27 1/2	@ .35
Carbon, bisulphide (drums).....	lb.	.06	@ .07 1/2
black (cases).....	lb.	.05	@ .06
tetrachloride (drums).....	lb.	.13	@
Caustic soda, 76 per cent. (bbbls.).....	cut.	5.00	@ 5.50
Chalk, precipitated, extra light.....	lb.	.04	@ .04 1/2
China clay, domestic.....	ton	8.00	@ 9.00
imported.....	ton	16.00	@ 24.00
Chrome, green.....	lb.	.08	@ .10
yellow.....	lb.	.10	@ 14 1/2
Cotton linters.....	lb.	.05	@ .08
Dichloroethane (drums).....	lb.	.12	@ 12 1/2
Emarex.....	ton	70.00	@ 75.00
Glass black.....	lb.	.07 1/2	@
Gilsonite.....	ton	37.50	@ 42.50
Glycerine, C. P. (drums).....	lb.	.10	@
Graphite, flake (250 to 400 pound bbl.).....	lb.	.14	@
powdered (250 to 400 pound bbl.).....	lb.	.14	@
Green oxide of chromium (casks).....	lb.	.30	@ .35
Ground glass.....	lb.	.02	@ .05
Iron oxide, red, reduced grades.....	lb.	.02	@ .05
red, pure.....	lb.	.05	@ .08 1/2
Hemlock.....	lb.	.07	@
Infusorial earth, powdered.....	ton	50.00	@
bolted.....	ton	60.00	@
Ivory, black.....	lb.	.08	@ .12
Indian red.....	lb.	.02 1/2	@ .05 1/2
Lampblack.....	lb.	.04	@ .08
Lead, red oxide of.....	lb.	.05	@ .06 1/2
sublimated.....	lb.	.03 1/2	@ .05 1/2
white, basic carbonate.....	lb.	.05 1/2	@ .05 1/2
white, basic sulphate.....	lb.	.05 1/2	@ .05 1/2
Lime, flour.....	lb.	.01	@ .02
hydrated.....	lb.	.01	@ .02
Litharase.....	lb.	.06	@ .07 1/2
English.....	lb.	.06 1/2	@ .07 1/2
Lithopone, domestic.....	lb.	.08 1/2	@ .09 1/2
imported.....	lb.	.08 1/2	@ .09 1/2
Magnesia, carbonate.....	lb.	.30	@ .35
calcined.....	lb.	.20	@ .27
light.....	lb.	.20	@ .27
Magnesite, calcined, powdered.....	ton	30.00	@ 35.00
Mica, powdered.....	lb.	.01 1/2	@ .05
Mineral rubber.....	lb.	.01 1/2	@ .04 1/2
Naphtha, stove grade (steel bbls.).....	gal.	.17	@
60-65 degrees.....	gal.	.22	@
68-72 degrees.....	gal.	.22	@
Oil, aniline.....	gal.	.95	@ 1.50
linseed (bbl.).....	gal.	.07	@ .07 1/2
palm.....	gal.	.60	@
pine (cases).....	gal.	.60	@ .40
rosin, heavy body.....	gal.	.28	@
tar (cases).....	gal.	.23	@
soluble aniline colors, yellow, orange, red, violet, blue, green.....	lb.	2.50	@
Orange mineral, domestic.....	lb.	.10	@
Petroleum grease.....	lb.	.03 1/2	@
Pine tar, return.....	gal.	.14	@
Pitch, burgundy.....	lb.	.15	@ .05
Plaster of paris.....	lb.	.10	@ 1.70
Prussian blue.....	lb.	.02	@ .03
Pumice stone, powdered (bbls.).....	lb.	.14	@
Rosin, Pontianak, refined.....	lb.	.10	@
granulated.....	lb.	.10	@
finest.....	lb.	.10	@
Rosin (500 pound bbls.).....	lb.	4.50	@

Rotten stone, powdered.....	lb.	.62 1/2	@ .04
Rubber, black.....	lb.	.07	@ .06
Rubber, sulphur, black.....	lb.	.07	@ .06 1/2
Staining, fast, orange.....	lb.	.07 1/2	@ .15
Stannous, powdered.....	ton	10.00	@ 11.00
Starch, corn, powdered.....	lb.	.02 1/2	@
Sulphur chloride (drums).....	lb.	.06 1/2	@ .07 1/2
Sulphur, flowers.....	cut.	2.20	@ 2.60
Sulphuric acid.....	lb.	.01 1/4	@ .02
Talc, American.....	lb.	8.50	@ 13.00
French.....	lb.	18.00	@ 25.00
Toluol, pure.....	gal.	4.00	@ 4.50
Triplite earth.....	ton	50.00	@
Turpentine, pure gum spirits.....	gal.	.56	@ .59
wood.....	gal.	.42	@ .49
Ultramarine, blue.....	lb.	.04	@ .22
Vermilion, brilliant.....	lb.	.75	@ .80
Chinese.....	lb.	1.40	@ 1.50
English.....	lb.	1.40	@ 1.50
Wax, bayberry.....	lb.	.22	@ .24
beeswax, white.....	lb.	.45	@ .60
ceresin, white.....	lb.	.14	@ .16
carnauba.....	lb.	.23	@ .40
zokerite, refined white.....	lb.	.22	@ .25
paraffin, refined, 118/120 m. p. (cases).....	lb.	.03 1/2	@
123/125 m. p. (cases).....	lb.	.04	@
128/130 m. p. (cases).....	lb.	.04 1/2	@
133/136 m. p. (cases).....	lb.	.06	@ .06 1/2
crude, white, 117/119 m. p. (bbls.).....	lb.	.03 1/2	@
yellow, 124/126 m. p. (bbls.).....	lb.	.03 1/2	@
Whiting, Alba, factory.....	ton	6.50	@ 7.50
commercial.....	cut.	.50	@ .55
gliders.....	cut.	.55	@ .65
Paris white American.....	cut.	1.15	@ 1.25
English chistone.....	cut.	.90	@ 1.25
Yellow ochre.....	lb.	.01 1/4	@ .02
Zinc oxide, American process (factory) horse head.....	lb.	.08 1/2	@
"special".....	lb.	.07 1/2	@
"XX red".....	lb.	.07 1/2	@
French process, green seal.....	lb.	.30 1/2	@
red seal.....	lb.	.30 1/2	@
white seal.....	lb.	.31 1/2	@
Zinc sulphide.....	lb.	.07	@ .07 1/2

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF RUBBER AND MANUFACTURES OF.

ARTICLES	August, 1915.		Eight Months-Ending August, 1915.	
	Quantity.	Value.	Quantity.	Value.
India rubber, etc., and substitutes for, and manufactures of.....	3,042,081	\$373,014	18,668,922	\$2,540,232
Unmanufactured—				
Balata..... pounds.....	31,347	\$118,793	1,506,783	\$566,631
Gutta percha.....	476,634	140,936	4,450,371	1,236,976
Gutta seriba.....	2,117,259	98,007	11,543,665	590,548
Gutta percha.....	134,698	15,278	1,168,303	140,677
Total.....	3,042,081	\$373,014	18,668,922	\$2,540,232
India rubber from:				
France..... pounds.....	55,097	\$66,723	320,031	\$190,774
Germany.....	480,363	106,060	6,987	843
Portugal.....	5,254,070	3,110,794	3,634,105	1,307,115
United Kingdom.....			34,342,588	
Central American States and British Honduras.....	93,569	43,567	864,948	388,904
Mexico.....	170,657	70,657	1,257,437	435,440
Brazil.....	3,039,813	919,927	33,951,402	14,512,211
Other South America.....	916,091	433,940	4,127,727	1,779,807
East Indies.....	7,012,832	3,687,539	27,731,300	12,371,889
Other countries.....	37,620	18,701	5,033,185	2,281,859
Total.....	17,060,113	\$8,501,908	140,745,276	\$70,057,418
India rubber scrap and refuse fit only for manufacture.....	1,648,585	\$116,390	7,520,815	\$514,213
Total in manufactures of.....		\$8,991,312		\$75,111,863
Manufactures of—				
Gutta percha..... dutiable.....		\$1,246		\$3,943
India rubber.....		32,181		364,181
Total manufactures of.....		\$33,427		\$368,124
Substitutes, elastic and similar..... dutiable.....		\$908		\$13,076

EXPORTS OF AMERICAN RUBBER GOODS.

ARTICLES		August, 1915.		Eight Months-Ending August, 1915.	
		Quantity.	Value.	Quantity.	Value.
India rubber, manufactures of:					
Scrap and old..... pounds.....		215,691	\$17,668	1,878,483	\$233,453
Reclaimed.....		488,519	63,056	4,120,737	\$562,818
Belting, hose and packing.....			184,330		1,253,247
Boots and shoes.....					
Boots.....		6,248	14,953	119,830	77,417
Shoes.....		138,053	84,861	1,346,261	1,028,047

Tires For automobiles.				EXPORTS OF FOREIGN MERCHANDISE.			
England	\$503,109	\$3,180,992		India rubber, etc. and substa-			
Canada	170,686	692,920		tutes for, and manufac-			
Mexico	59,36	71,387		tutes of:			
Cuba	22,028	187,655		Unmanufactured:			
Australia	91,134	311,255		Balata	35,022	\$13,258	725,105
Philippine Islands	22,465	195,332		Goodyear gum	18,500	7,770	47,391
Other countries	196,456	869,756		Gutta jelutong	162	18	162
Total automobile tires	\$1,211,804	\$5,509,787		Gutta percha	47,289	49,178	10,297
All other	988,571	988,366		India rubber	115,794	3,288,097	1,067,234
All other manufactures of	483,430	3,089,473		India rubber scraps	3,483	373	
Total	\$2,358,873	\$12,955,588		Total unmanufactured	300,923	\$136,840	4,113,416
				Manufactures of India rub-			
				ber		\$391	\$4,186
				Substitute			
				elastic and			364

IMPORTS AND EXPORTS OF RUBBER AND RUBBER MANUFACTURES AT THE PORT OF NEW YORK.

IMPORTS. The quantity is given in packages.

Week ending	India Rubber.		Rubber Waste.		Rubber Manufactures.		Chicle.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
September 25, 1915	42,673	\$3,766,153	50	\$12,889	52	\$11,989	41	\$2,203
October 2	88,446	2,568,501	69	518	17	3,214	522	83,357
October 9	26,953	1,984,206	57	2,853	23	3,180	51	17,22
October 16	32,340	2,667,484	592	7,889	26	2,182	355	21,778
October 23	15,020	1,108,813	197	2,748	63	3,980	514	22,749

EXPORTS.—August 1 to August 31, 1915.

MANUFACTURES TO—	Rubber Goods not specified.		Hose.		Dress Shields.		Aero planes.		Rubber Cement.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Africa	75,238	\$800	1,725	\$140						
Argentina	21,200	290	1,373							
Australia	42,263	217	987							
Bolivia	207									
Brazil	34,813		461							
British Guiana	982									
Canada	2,668									
Central America	12,040	1,636	1,287							
Ceylon	280									
Chile	12,444		154							
China	1,329		533							
Colombia	3,676	1,464		134						
Curacao	233									
Dutch Guiana	241									
Ecuador	468	2,605								
France	20,289									
Great Britain	736,601	4,116	\$1,898	\$588,361						
Greece	150									
Holland	1,719									
India	3,100									
Italy	208,656			2,830						
Japan	6,684		2,830							
Java	10,310		179							
MANUFACTURES TO—										
Mexico										
New Zealand										
Norway, Sweden										
and Denmark										
Peru										
Portugal										
Russia										
Siam										
Singapore										
Spain										
Venezuela										
West Indies										
Total	\$1,357,597	\$15,569	\$33,474	\$1,898	\$591,191	\$682				
UNMANUFACTURED										
Crude Rubber										
Gutta Percha										
Balata										
Reclaimed Rubber										
Rubber Scrap										
Rubber Sub-										
stitute										
France										
Great Britain										
Italy										
Japan										
Total	\$13,607	\$1,710	\$2,151	\$2,000	\$11,274	\$200				

EXPORTS.—September 1 to 15, 1915.

MANUFACTURES TO—	Belting, Hose and Packing.		Footwear.		Tires.		Other mfs. of India Rubber.		Fountain Pens.		Chewing Gum.		Reclaimed Rubber.		Scrap.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Africa	\$2,242	\$590	\$198	\$6,123	\$138	\$3,663	\$3,822	\$32,206			\$297	\$4074	\$232			
Argentina	3,517			15,204	2,104	4,021	740									
Australia	216			10,090	1,474	4,860	471									
Brazil	827			15,434	199	29										
Bolivia	95			417	145	246										
British Guiana	179			199	246	3,898	651									
Canada	125			582	688	50										
Central America and Panama	5,463			3,861	2,922	68,860	3,519									
Chile	1,219			67	146	11										
China	183			1,981	788	954	50									
Colombia	567			85	30,104	12,179	3,899									
Ecuador	479			69	92,206	75,243	16,805									
France	111			70	70	21,348	316									
Great Britain	9,881			231,645	492	3,319	500									
Greece				1,395	251	700	365									
Holland				598	135	250										
India	208			1,119	1,088	12,850										
Italy	692			1,119	4,839	3,602										
Japan	309			1,088	12,850	3,602										
Mexico	90			1,119	4,839	3,602										
New Zealand				1,088	12,850	3,602										
Norway, Sweden and Denmark				86	463	10,100	200									
Oceania				343	70	200	37									
Peru	1,050			929	121	34										
Portugal				2,569	121	34										
Romania				3,245	591	2,799	239									
Russia				1,731	591	2,799	239									
Spain	192			512	223	20,927	27,783									
Trinidad																
Venezuela	347															
West Indies	9,198															
Totals	\$37,435	\$1,391	\$10,362	\$308,387	\$191,866	\$271,273	\$38,706	\$4,177	\$10,293	\$11,492	\$6,055					

In addition to the above the following were exported during the same period: To Great Britain, aeroplanes valued at \$45,350 and balata valued at \$14,135; to Chile, gutta percha valued at \$19, and to Venezuela, india rubber valued at \$53.

RUBBER STATISTICS FOR CANADA.

IMPORTS OF RUBBER AND MANUFACTURES OF

	July, 1915.		Four Months Ending July, 1915.	
	Quantity.	Value.	Quantity.	Value.
UNMANUFACTURED RUBBER.				
Rubber and gutta percha, crude, in blocks or in sheets of india rubber:				
From Great Britain....pounds	574,515	\$331,749	1,182,001	\$663,019
United States.....	14,000	10,000	10,000	10,000
B. Straits Settlements.....		11,300		5,346
Other countries.....		106,000		70,000
Total.....	818,134	\$458,428	2,542,590	\$1,318,895
Rubber, recovered:				
From Great Britain.....		6,000		82,482
United States.....	366,000	\$46,484	1,042,005	\$127,529
Total.....	366,000	\$46,484	1,462,797	\$190,061
Rubber substitute:				
From Great Britain.....	5,882	\$665	19,000	\$1,100
United States.....	35,158	2,045	154,000	11,640
Total.....	41,040	\$2,710	164,000	\$12,740
Rubber, powdered, and rubber or gutta-percha waste or junk:				
From United States.....	110,669	\$5,015	293,000	\$26,303
Other countries.....	2,219	98	2,310	105
Total.....	112,888	\$5,113	295,310	\$26,408
Latata, crude:				
From United States.....	1,103	\$689	1,333	\$820
Chicle or sapota gum, crude:				
From United States.....	1,485	\$796	101,985	\$41,401
B. Honduras.....	129,440	37,004	509,300	184,423
Mexico.....			126,294	46,238
Total.....	121,925	\$37,800	737,579	\$272,062
Hard Rubber, in sheets:				
From United States.....	9,394	\$882	34,667	\$3,383
Rubber thread, not covered:				
From United States.....	2,694	\$3,742	8,372	\$11,605
MANUFACTURED, DUTABLE.				
	General Tariff Value.	Preferential Tariff Value.	General Tariff Value.	Preferential Tariff Value.
Clothing, and clothing made with proof with india rubber:				
From Great Britain.....	\$64	\$55,354	\$1,811	\$178,811
United States.....	15,346		48,000	
Other countries.....			21	
Total.....	\$15,410	\$55,354	\$50,117	\$178,811
Hose, including cotton or linen lined with rubber:				
From Great Britain.....		\$37		\$369
United States.....	\$4,712		\$28,775	
Mats and Matting:				
From Great Britain.....				\$84
United States.....	\$51			\$446
Packing:				
From Great Britain.....			\$80	\$493
United States.....	\$4,091		\$17,523	
Total.....	\$4,091		\$17,603	\$493
Tires of rubber for all vehicles:				
From Great Britain.....		\$2,192	\$6,587	\$12,181
United States.....	101,394		\$92,108	
France.....			118,500	
Other countries.....			279	
Total.....	\$106,397	\$2,192	\$414,374	\$12,181
*Rubber cement, and all mfr. of india rubber and gutta percha, N. O. P.:				
From Great Britain.....	\$121	\$22,314	\$1,000	\$74,589
United States.....	11,803		19,500	
Other countries.....	12		37	
Total.....	\$41,960	\$22,314	\$193,667	\$74,589
Hard Rubber, unfinished, in tube for mfr. of fountain pens:				
From United States.....	\$836		\$1,941	
Wetling, elastic, over one inch wide:				
From Great Britain.....		\$1,670		\$4,121
United States.....	\$10,575		\$41,356	
Other countries.....			2	
Total.....	\$10,575	\$1,670	\$41,358	\$4,121
Boots and Shoes:				
From Great Britain.....				\$3,667
United States.....			\$18,992	

From Great Britain
United States

*The value of rubber cement, and all mfr. of india rubber and gutta percha under treaty from the four months ending July was \$591.

EXPORTS OF RUBBER AND MANUFACTURES OF RUBBER TO FOREIGN COUNTRIES

	July, 1915.		Four Months Ending July, 1915.	
	Quantity.	Value.	Quantity.	Value.
Belting:				
To United States.....				\$3,996
Newfoundland.....				3,049
To Great Britain.....				1,917
United States.....				
Newfoundland.....				
Other countries.....				
Total.....		\$1,401		\$8,974
Hats and Shoes:				
To Great Britain.....		\$8,83		\$1,303
United States.....		1,004		88
Newfoundland.....				477
Australia.....		24		354
Other countries.....		1,548		1,234
Total.....		\$5,987		\$3,448
Mats and Matting:				
To other countries.....				\$418
Clothing:				
To Great Britain.....				\$7
United States.....		\$29		\$30
Newfoundland.....				140
Other countries.....				11
Total.....		\$29		\$30
*Rubber Waste:				
To United States.....		\$69,825	\$1,624	\$188,883
All Other, N. O. P.:				
To Great Britain.....		\$40,504		\$536
United States.....		2,188		501
Newfoundland.....		298		2,904
Australia.....				1,984
Other countries.....		4,136		10
Total.....		\$53,173		\$1,107
*Gum Chicle:				
To Great Britain.....				\$3,000
United States.....		\$53,504		\$15,000
Other countries.....		3,152		211,004
Total.....		\$56,656		\$15,000

*The total amount of rubber waste exported during July was 1,011,000 pounds, and for the four months ending July was 19,047,700 pounds.
*The total amount of gum chicle exported during July was 71,656 pounds, and for the four months ending July was 613,235 pounds.

UNITED KINGDOM RUBBER STATISTICS FOR MONTH ENDING SEPTEMBER 30, 1915.

	September, 1915.		New Months Ending September, 1915.	
	Quantity.	Value.	Quantity.	Value.
Unmanufactured Cane Rubber:				
From—				
Dutch East Indies....pounds	456,400	\$254,319	4,539,300	\$3,411,833
French West Africa.....	101,300	41,417	1,026,000	447,839
Gold Coast.....	45,200	14,390	470,800	143,263
Other countries in Africa.....	436,300	226,291	4,447,800	3,776,727
Peru.....	2,000	1,098	14,000	7,134
Brazil.....	903,300	476,338	2,126,000	1,161,470
British India.....	363,800	196,743	2,284,800	1,192,751
Straits Settlements and dependencies, including Labuan.....	4,627,400	2,546,251	51,130,800	26,936,035
Federated Malay States.....	389,300	1,354,166	20,928,300	11,503,149
Ceylon and dependencies.....	1,801,800	1,046,747	22,455,600	11,910,256
Other countries.....	229,000	115,401	3,254,000	1,565,216
*Total.....		\$6,273,161		\$26,714,129
*Waste and reclaimed rubber:				
Gutta percha.....	297,900	\$26,978	5,000,200	\$337,383
	471,400	47,078	5,207,800	404,319
Manufactured:				
Apparel, waterproofed.....		\$6,955		\$36,791
Boots and shoes—dozen pairs.....	15,865	119,561	50,216	634,081
Insulated wire.....		50,008		96,641
Submarine cables.....		1,098		607
Motor tires and tubes.....		1,369,398		5,478,061
Motorcycle tires and tubes.....		11,410		435,800
Cycle tires and tubes.....		2,381		100,116
Tires not specified.....		4,019		20,111

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UNITED KINGDOM STATISTICS.

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EXPORTS, UNITED KINGDOM.

Manufactured—				
Apparel, waterproofed:				
To France.....	\$16,884	\$123,376	
British South Africa.....	21,846	.....	163,312	
British East Indies.....	2,168	.....	115,746	
Australia.....	3,266	.....	184,431	
New Zealand.....	5,861	.....	114,346	
Canada.....	17,253	.....	399,390	
Other countries.....	98,221	.....	925,470	
Total.....	\$165,499	.....	\$2,027,071	
Boots and shoes—dozen pairs.....	7,910	\$37,456	86,726	\$457,161
Insulated wire.....	210,078	.....	.....	1,133,532
Submarine cables.....	15,824	.....	.....	1,354,337
Motor tires and tubes.....	236,700	.....	.....	2,447,083
Motorcycle tires and tubes.....	35,547	.....	.....	284,432
Cycle tires and tubes.....	149,630	.....	.....	1,485,435
Tires not specified.....	52,580	.....	.....	398,224
Manufactures not specified.....	432,710	.....	.....	3,643,338

EXPORTS, FOREIGN AND COLONIAL.

Unmanufactured				
"Crude Rubber:				
To Russia.....pounds 1,568,400	\$812,315	17,949,800	\$14,627,529	
France.....	1,386,600	789,143	11,495,900	6,455,280
United States.....	5,409,700	3,021,211	67,923,500	36,367,822
Other countries.....	1,316,000	730,470	13,934,100	7,654,432
Total.....	9,680,700	\$5,353,139	111,303,300	\$65,105,053
Gutta percha.....pounds 23,200	\$14,206	691,300	\$305,927	
"Waste and reclaimed.....	85,900	11,620	578,700	93,744
Manufactured—				
Apparel, waterproofed.....	\$934	.....	\$2,928	
Boots and shoes—dozen pairs.....	2,078	13,103	6,857	54,204
Insulated wire.....	20,015	.....	.....	27,974
Motor tires and tubes.....	210,078	.....	.....	2,124,110
Motorcycle tires and tubes.....	7,008	.....	.....	56,984
Cycle tires and tubes.....	5,978	.....	.....	104,509
Tires not specified.....	.....	.....	.....	21,671

"Included in "Rubber" prior to 1915. After 1914 "Rubber" is separated into "Raw" and "Waste and Reclaimed"

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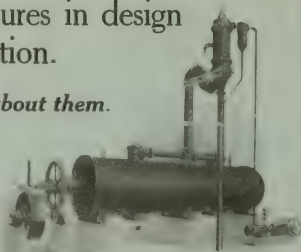


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THE CRUDE RUBBER GUESSING CONTEST.

FROM a normal and fairly satisfactory price level of 62 cents, First Latex Crêpe has suddenly risen to 83 cents, and that without apparent cause. Those who buy, and eke those who sell, particularly the latter, are trying to tell the reason why. These guesses, for as yet they are nothing else, are of more than academic interest. They follow along in order about like this:

The Suez Canal is closed, or about to be closed, deflecting or holding up rubber cargoes for some weeks.

Several of the great tin and rubber carriers have been torpedoed and sunk in the Mediterranean.

The British Government has suddenly commandeered five to ten thousand tons of rubber.

British firms having German affiliations have placed large orders for rubber, thus incidentally suggesting an early peace.

A longer delay in the clearing of the Panama Canal than was expected.

Serious conditions in Ceylon and the Malay States because of native uprisings.

The presence of big rubber buyers in the Far East who are placing large orders for future delivery.

The fact that the big manufacturers have been out of the market for months and that they have at last begun to buy largely.

All of the above are guesses, and as such are equally valuable.

The fact remains, however, of the unexplained advance in plantation sorts, and the sympathetic rise in the prices of Brazilian rubber and rubber scrap.

Verily, with higher rubber, more costly cotton and compounding ingredients at prohibitive prices, some slight advance in prices of manufactured goods is in order.

DEARTH OF COMPOUNDING INGREDIENTS.

CAN the American rubber trade face the new year confidently so far as chemicals and compounding ingredients are concerned? Will our sources of supply suffice in 1916, and will the prices be reasonably steady? These are questions that have been asked frequently of late; and we have made a survey of the field and sought the opinions of men qualified to speak authoritatively. In our columns elsewhere the results are given at some length; and the prospect for some of the important materials is decidedly unpromising.

However, there is this to be remembered: none of the ingredients that are becoming so scarce and costly are absolute necessities. Other colors, different compounds, a great variety of substitutions will enable the rubber manufacturers to turn out goods just as acceptable as of yore. And in due time all of the high-priced ingredients will be made in our factories.

RUBBER AND COMPOUNDING RESERVES.

SOME time ago the price of crude rubber reached the high mark of three dollars a pound. There were those, chiefly rubber producers, who believed that it would remain there for a period of years at least. Just at that time, however, there came into the market enormous quantities of rubber scrap, notably motor tires, which under improved reclaiming processes became crude rubber and proved one of the great factors in driving the price down to a reasonably low figure. Thus the rubber

manufacturers were not without a reserve to call upon in times of stress.

A similar condition exists today in respect to various compounding ingredients. Many are scarce, or held at prohibitive prices. There is, however, a vast amount held in reserve in the world's scrap rubber. White scrap may be turned into white rubber again. Antimony stocks may be reclaimed, and so on. All that is needed is a little more careful sorting. The reserve is there for use until prices come down again.

RUBBER MANUFACTURE AND HEALTH.

THE bare suggestion to the old timer that rubber manufacture was anything but healthful would be received with scorn. Nay, facts, incontrovertible so far as rule of thumb reasoning went, could be adduced to support the theory of healthfulness. For example, in the first of the big rubber shoe factories, compounds were known as "paints". They were made up of whiting, lampblack, lime, barytes, white lead, litharge and sulphur. All of these were mixed together in a large bin, by a man with a hoe, and then run through burr mills to ensure further mixing and a greater degree of fineness. The men who did the hoeing and the burr mill mixing, ate, breathed, and absorbed the powders, but that they were anything but healthy would be strenuously denied. Indeed, if we listen to factory tradition, rubber work is very healthful. When other and nearby industries are afflicted with smallpox, scarlet fever, German measles and the like, how very often it happens that the rubber mills are immune. The workman explains it by the presence of sulphur in the air, and also hazards the idea that "bugs" will not live with naphtha and similar fumes. There is also a superstition among old rubber men that while lightning may smite almost any building, even a church, it never strikes a rubber factory.

There has ever been a sort of half knowledge in the trade that litharge might induce lead poisoning. But the cases where it was known were few and far between. Workers also were made slightly sick by naphtha fumes, but they recovered quickly and were properly ashamed of themselves afterward.

Chloride of sulphur was ever recognized as poisonous, and even in the smallest dipping shops the workers were protected from its fumes as much as possible. In fact, few until quite recently used the cold cure.

As for the commoner ingredients, the chalks, talcs,

oils, gums and waxes, as well as the evil-smelling rubber, the workmen were steeped in and powdered with them all, and lived to ripe old age in spite of them.

That is why, when rumors of investigations were heard, they were so scornfully received.

Nevertheless, on the part of the efficiency men and the big manufacturers, and the rubber chemists there was nothing but welcome for the government investigator who hunted down possible poisons in compounds and the poisoned among workmen. Now that the report has been handed in and scanned it shows the trade to be in good shape. Where harmful ingredients are used the men are pretty generally guarded. When they are not, the suggestions in the report point a way toward absolute safety.

GOODRICH GOOD ENGLISH.

AS "The Sun," New York, is noted among newspapers for its correct and sonorous English, so is The B. F. Goodrich Co. noted among rubber manufacturers. This reputation dates from the time, some years ago, when instead of writing "we are sending in same mail," as was usual, they put it, "we are forwarding by correlative post." Their latest bid for super-excellence in English is a tire tread made of "Hyper-Rubber." Lexicographers are more or less familiar with "Hyper" as an anti-skid on such smooth tread words for example as critical, and sensitive. It means in effect a little bit more than the most, better than the best. If the Goodrich Hyper-Rubber is really what its name implies, the compound must be a Hyper-Hummer.

MR. JOHN P. LYONS, FOR FOUR YEARS PAST ASSOCIATE editor of THE INDIA RUBBER WORLD, resigned his position early in November and will spend the winter in Southern California. His many friends trust that the change of climate will be of great benefit, both to his invalid wife and to Mr. Lyons himself.

THE RUBBER COVERED WIRE ENGINEERS' ASSOCIATION was perhaps the oldest rubber club in the United States. At all events it was started one year before the New England Rubber Club. It now comes into prominence by merging its identity with that of the Associated Manufacturers of Electrical Supplies. This adds strength to both organizations, and is where the older association belongs, together with all of the cable, conduit, storage battery and insulation manufacturers.

Industrial Poisons in Rubber Manufacture.

It has long been known that some of the solvents and compounding ingredients used in rubber manufacture are injurious to health. It is also a fact that, to the best of our ability, many rubber manufacturers have guarded against dele-

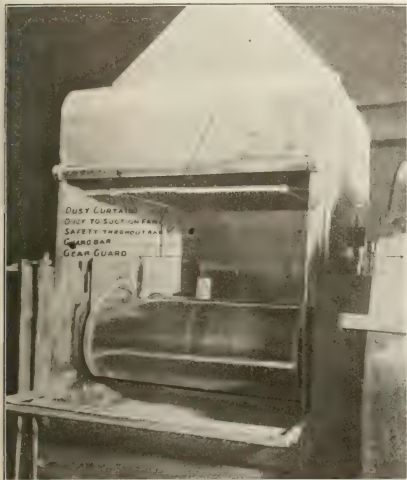
basic carbonate of lead, red lead, antimony pentasulphide and trisulphide, aniline oil, naphtha, benzine, coal tar benzol, carbon disulphide, and carbon tetrachloride.

Of the lead compounds, the most dangerous is said to be white lead, although litharge is nearly as bad. Sublimed white lead is not as poisonous as either of the two mentioned, but is poisonous if handled carelessly or inhaled as dust. Lead poisoning is brought about by breathing lead-contaminated air, by eating food or chewing tobacco that has been handled by lead-smeared hands.

LEAD POISONING AMONG RUBBER WORKERS

Quoting from Dr. Hamilton's report:

Lead poisoning is essentially a chronic disease marked by gentle attacks. The development of the symptoms is slow and insidious, and by the time they become acute the man has absorbed a good deal of the poison, and recovery from the acute symptoms does not mean that he is free from chronic plumbism. The first symptoms usually noted are loss of appetite, a disagreeable taste in the mouth, indigestion, loss of strength, constipation, more or less insomnia and headache. An acute attack is usually ushered in by obstinate constipation and is characterized by agonizing colic. In other cases it is the nervous system chiefly that is affected. Insomnia, headache, weakness of the muscles most often used, chiefly of the extensors of the wrist, attacks of mental confusion, even loss of consciousness and convulsions, are the symptoms in this type of cases, and they may or may not be accompanied by typical lead colic. Aside from these acute attacks, a slow chronic change takes place in the lead-poisoned workman, leading to profound anemia, hardening of the blood vessels, and alterations in such organs as the kidneys, liver, and heart, and to more or less permanent paralysis of forearms or ankles. There are many other changes which may be brought



A PROTECTED MIXING MILL.

terious dust and fumes wherever poisonous ingredients were used. Up to the present time, however, that work has been individual, as there has been no general knowledge upon which to base preventive measures. The Bureau of Labor Statistics of the United States, in its investigation of Industrial Accidents and Hygiene, has taken up the subject and reported upon it very thoroughly. This report is in the form of an illustrated bulletin of 64 pages, written by Alice Hamilton, A.M., M.D., and is the result of two years personal investigation of the leading rubber factories of the United States.*

Thirty-five factories in the following cities: Boston, Massachusetts, including three suburbs; Hudson, Massachusetts; Providence, Rhode Island; New Haven and Naugatuck, Connecticut; Tuckahoe, New York; Trenton and Lambertville, New Jersey; Akron, Ashland, Cleveland, and Youngstown, Ohio; Detroit, Michigan; Mishawaka, Indiana; and Chicago, Illinois, were visited and investigated. The lines covered were: Footwear, Mechanical Rubber Goods, Tires, Druggists' Sundries and Toys, Hard Rubber, Proofing and Rubber Reclaiming. The departments investigated in general were the compounding room; the mixing mills for dry compounding, solution mixing, spreading and dipping, while under vulcanizing; the dry heat, steam heat, press work, and especially the acid and vapor cures being taken up in order.

The poisonous substances listed are litharge, sublimed lead,

*Bulletin of the United States Bureau of Labor Statistics, No. 129. By Alice M. Hamilton, A.M., M.D. Industrial Poisons Used in the Rubber Industry.



MACHINE FOR RECOVERING ENDS OF INNER TIRES.

about by lead poisoning, but the above is a description of the more typical forms.

Records were secured of 66 cases of lead poisoning in rubber works during 1914, distributed among the various branches of the trade as follows: tires 27, footwear 9, clothing 6, druggists'

supplies 3, mechanical rubber 1, factories making all kinds of goods 20. These men were working in the compounding and mill rooms. The greater number had been employed more than a year, but one compounder had worked only 3 months, another 9 months, and a third 11 months before they were taken ill. The men who had worked for longer periods showed evidence of chronic plumbism.

ANTIMONY SULPHURETS

No physician was found who had absolutely recognized a case of antimony poisoning in a rubber worker. Dr. A. J. Carlson, of the Hull Physiological Laboratory of the University of Chicago, was furnished by Dr. Geer of The B. F. Goodrich Co., with samples of crimson sulphuret of antimony and golden sulphuret of antimony. He found them soluble in human gastric juice. Symptoms of antimonial poisoning are as follows:

Abdominal pain, nausea, loss of appetite, dysenteric attacks, sores in the mouth, salivation, wasting, weak heart, attacks of dizziness, and albuminuria or glycosuria. In the rubber industry the golden sulphide is handled in large quantities and usually with the utmost recklessness. One can see men powdered with it from head to foot. The fact that no physician who was interviewed had ever seen what he recognized as a case of antimony poisoning in a rubber worker is not very significant, because the symptoms of antimony poisoning could easily be masked by or mistaken for the symptoms of lead poisoning, since both chemicals are used in the compounding rooms and on the mixing mills.

ANILINE OIL

Dr. Hamilton found one physician attached to a large plant who had observed over 100 cases of aniline poisoning. In this plant hoods have been installed to carry off the fumes. The men have been instructed to watch for the warning symptoms and then to go out into the open air at once, and he now has only slight cases.

Industrial poisoning from aniline oil is well known, for many cases have occurred in the great German factories in which aniline derivatives are made. The oil is a volatile poison affecting the nervous system and acting destructively upon the red blood corpuscles. The first symptom of aniline poisoning is pallor, which soon changes to a striking bluish color, especially in the lips. There is usually severe headache and general weakness and, if the exposure to the fumes continues, loss of consciousness which may be prolonged alarmingly. The breath and the urine smell of aniline and the blood shows changes due to the withdrawal of oxygen and the destruction of the red blood cells.

Aniline oil vaporizes at room temperature and is absorbed chiefly through the respiratory tract, but may be absorbed also through the skin. In the rubber industry the men are exposed to the fumes of aniline in the compounding room, where it is kept and measured out, and in the mill room, where it is poured over the rubber in the mixing mills or in the "warm-up" mills. The cylinders of these mills are heated to soften the rubber, and the heat aids in volatilizing the aniline. Even the rubber on the calenders may give off fumes of aniline.

Acute aniline poisoning, both mild and severe, is not at all uncommon in Akron, and not only workmen, but physicians, speak of the victims as "blue men," or "blue boys," because the most distinctive symptom is the intense cyanosis. It is said that severe cases used to occur quite often a few years ago when aniline was first introduced into the Akron plants, and the doctors did not at once recognize which was the chemical responsible for the trouble. Since that time serious efforts have been made in some plants to protect the users from fumes. The first record of aniline poisoning in the rubber industry in this country seems to be that contained in the recent report of Dr. E. R. Hayhurst, of the Ohio State Board of Health. Dr. Hayhurst found three cases of aniline poisoning in the compounding and milling departments of rubber factories in Ohio.

Most of the information gathered concerning cases of aniline poisoning in Akron dated back several years, to the time when the danger was not appreciated and safeguards not yet introduced.

COAL TAR BENZOL

No cases of poisoning by this solvent were noted in American factories. Several were reported in European factories.

Benzol is not used nearly so much in the United States as in Germany. It is twice as expensive as petroleum in this country, while in Germany and Austria it is somewhat cheaper than petroleum. A very complete study, both historical and experimental, on the effects of the vapors of coal-tar benzol and petroleum naphtha and benzene as used in industrial processes was made by K. B. Lehmann and his assistants in the University of Wurzburg. Benzol is a product of the distillation of coal tar or coke, passing over at about 90 degrees to 95 degrees C. (194 degrees to 203 degrees F.). The commercial variety is about 85 per cent. pure. Lehmann's experiments on animals showed that the fumes of benzol cause irritation of the mucous membranes of throat and larynx, and of the eyes; muscular twitchings, and, later, convulsions, unconsciousness, fall of body temperature, and death from respiratory paralysis. The same symptoms have been noticed in cases of violent acute poisoning in human beings who have entered vats containing benzol or spilled large quantities of it and inhaled the fumes, but the poisoning that occurs in rubber factories is

neither so rapid nor so intense and the symptoms are not so typical.

ACUTE PETROLEUM POISONING.

One case was reported of a man who worked in a dipping room.

The symptoms of poisoning by benzene vapors are usually given as headache, nausea, stupid feeling, heaviness or sleepiness, roaring in the ears, inclination to cough, feeling of irritation and constriction in the throat, trembling of the hands and arms, sensation of crawling over the skin, excitement or irritability. Girls are said to grow very talkative and foolish and laugh a great deal; men are said to be easily provoked to anger and are unreasonable. These symptoms may be felt most intensely during the first hours of the day, but in other cases they come on when the person leaves work and goes out into the open air. The workpeople call an acute attack of such poisoning a "naphtha jag."

Rarely is the severe acute form of benzene poisoning seen in this country except in places such as oil wells and refineries, where the exposure to fumes is great. Occasionally, however,



DEODORIZING ROOM.

a severe case may occur among the men employed in the naphtha churning rooms of a rubber factory, for when many different kinds of cement are used the churns have to be cleaned out, and the fumes of naphtha may be heavy enough to overcome the workmen who do this. Another place where severe naphtha poisoning may occur is in the dipping room. The men here work over large tanks filled with thin rubber cement and the temperature of the room is kept at 90 to 98 degrees F., to hasten the evaporation of the naphtha. A case of this sort from a dipping room was reported to us by a physician in an Ohio town. The patient, a strong man, was found by the physician lying in bed comatose, with cold skin, pale, and almost pulseless. He had been dipping wooden forms of gloves into the tank of cement and had felt so dizzy and ill that he was obliged to leave work and go home, but on the way he began to stagger and would have fallen had not two men half carried him home. He was put to bed and did not then did he lose consciousness. His illness lasted several days, but he recovered completely, never, however, venturing to go back to the same sort of work.

CHRONIC NAPHTHA POISONING.

The author, after referring to British records, turns to a report of the Massachusetts General Hospital, 1913-1914. A number of rubber workers applied for treatment for various disorders. The supposition was that they were caused by benzene poisoning, but the records are not regarded as being beyond doubt. Several cases of rubber workers who made or used rubber cement are cited, however, by Dr. Hamilton, which would seem to prove the poisonous effect of the fumes on certain workmen. She says:

As for symptoms, the workpeople claim that they taste naphtha all the time and that this destroys their appetite for food. An attack of "naphtha jag" is succeeded by a stage of depression and dullness, with clouded memory, and on the following day headache, loathing for food, and a feeling of exhaustion.

CARBON DISULPHIDE.

The extremely dangerous character of this compound is discussed at some length, the facts being gathered in European rubber factories. Few physicians in the United States seem to have recognized this poison or its properties. Dr. Hamilton gives several cases of poisoning from this solvent, the following being typical:

The two most dangerous poisons which are encountered in the rubber industry are used in the so-called acid cure or cold cure and in the vapor cure, processes by which sulphur in the form of the monochloride is introduced into the rubber. It is not the monochloride itself that is dangerous, for, according to Lehmann, who tested it experimentally, sulphur monochloride causes nothing more than an irritation of the conjunctiva and of the mucous membranes of nose and throat. The danger is in the

addition of carbon disulphide or carbon tetrachloride or benzol, and these are poisonous in the order mentioned.

Most of the physicians in our rubber-manufacture towns do not seem to have even heard of the use of carbon disulphide in the rubber industry, nor are they familiar with its toxic properties. Consequently it is very hard to determine whether or not the use of it results in serious trouble. It is certainly

possible that the insane asylums have received cases of unrecognized carbon disulphide psychosis, since insane rubber workers are committed from these towns without any inquiry being made as to the exact occupation of the patient and the possible industrial source of his disease. Most of the cases of poisoning discovered in the course of this inquiry were described by foremen of factories, only a few by physicians.

The foreman of the cold-curing department of a dipped-goods factory was very eloquent on the subject of carbon disulphide poisoning. He said his men used to go crazy from the fumes until he made them work for short spells

only, alternating with other work. During the preceding year he had had 12 men under him and all had felt the effects in some way, complaining of headache and dizziness, or indigestion, or loss of mental power, or loss of memory, or muscular weakness, especially in the legs. He himself suffered a good deal from dizziness and severe occipital headache, and had lost strength. He said he always felt the effects of the fumes most at the beginning of the week or after a vacation. Sleeplessness was one of his chief complaints, while one of his workmen said that the fumes made him drowsy all the time—he could drop off to sleep whenever he sat down.

CARBON TETRACHLORIDE.

This, as a rule, has been thought to be not particularly harmful. Investigation in European factories, however, proved it to be distinctly poisonous. The report on the American factories is as follows:

In the effort to avoid the fire risk from carbon disulphide fumes several American rubber factories are now using the non-inflammable carbon tetrachloride, which is, however, not as powerful a rubber solvent as carbon disulphide and is more expensive. Superintendents and chemists in the factories where the former is used are apparently ignorant of its harmfulness, and this is hardly to be wondered at since the ordinary textbooks of toxicology do not even mention it, and the few that do have very little to say about it. Von Jaksch speaks of severe nervous disturbances having occurred among workmen who used a mixture containing carbon tetrachloride on the inside of boilers to prevent incrustations. Galamer simply states that this substance is used in industry and may cause poisoning with symptoms like those of chloroform.

Carbon tetrachloride was found actually in use in only three factories. In one of them a man who had dipped rubber goods in a solution for seven months complained of nausea and loss of appetite, which he attributed to his occupation. In another,



ACID CURING OR COLD CURING OF BALLOONS.

a tire factory where the liquid is painted on the ends of inner tubes, a workman stated that since he had been doing this sort of work he had lost weight and that he felt a constant irritation of the eyes, nose, and throat. In the third factory two splicers believed that their health had suffered from the effects of the carbon tetrachloride vapors. One, especially, said that he had lost many pounds in weight, that he had nausea and loss of appetite, vomited frequently, and felt weak all over. The men who do the work without wearing gloves are liable to a dermatitis of the hands and arms.

Dr. Hamilton finds that in many of the factories using the poisonous ingredients under consideration great care has been taken to keep the workers from coming in contact with these substances. In many others, however, she finds that little or no attention has been paid to the matter. She suggests arrangements in the compounding room so that dust from the lead and antimony compounds be obviated. This may be done by automatic weighing appliances, closed receptacles and avoidance, as much as possible, of personal contact in handling.

For poisonous ingredients, mixing mills should be fitted with powerful exhaust hoods and arrangements whereby the worker neither directly handles nor breathes the dust.

In using ingredients or solvents which give off injurious fumes, exhaust hoods, perfect ventilation, closed cans and cups are advised.

In other words, if the workman is protected against breathing the fumes, inhaling or handling poisonous dust, the danger of poisoning is reduced to a minimum.

The whole report is not only timely, but is exceedingly clear and comprehensive. Dr. Hamilton has wonderfully grasped the general details of rubber manufacture, which is shown by the complete avoidance of the usual minor but irritating technical blunders that writers not themselves rubber experts are so prone to indulge in.

RUBBER AS RELATED TO THE WAR.

A VERY interesting lecture, illustrated by lantern slides, was given on November 9 by A. D. Thornton, of the Canadian Consolidated Rubber Co., Limited, before the Canadian Railway Club, at Montreal, Canada. Mr. Thornton said in part:

"Now, as to rubber and its uses in the great European war. Well, there is hardly any detail of equipment in which it does not figure. First and foremost is the use of automobile and truck tires; the consumption here is enormous. Huge quantities are manufactured by the Allies, then again factories in Canada and the United States are running overtime on these lines; hip boots for the men in the trenches are being manufactured for the coming winter; one million waterproof capes were recently ordered by the British Government. Ground sheets are used for almost any purpose; the men lie upon them when firing, sleeping, etc., also when tents are cleared out in the morning all the blankets, clothing, etc., are placed on one of these sheets, spread on the ground. If the British force is 3,000,000 men, and every man had a sheet, the weight would be 3,750 tons. In the hospitals we find rubber sheeting, air cushions, hot water bottles, ice bags, drainage tubes and many other surgical instruments.

"But now let me come to the point where rubber must be used; where it is absolutely essential.

"There is no explosive made from rubber, but I am quite safe in saying that without the assistance of rubber no explosives could be manufactured.

"In the manufacture of dynamite, which is an infusorial earth saturated with nitro-glycerin, rubber is very essential. Nitro-glycerin is both a poison and a tonic, and in the hot weather the operators perspire freely, and unless they use rubber gloves, the tonic exudation enters the system and it is quickly poisoned. In addition to gloves, they must wear rubber boots.

"The manufacture of 'Smokeless' calls for the use of rubber in almost the same way. The base is cotton waste, which, when saturated with nitric acid, undergoes a chemical change. It be-

comes an explosive, and is called gun cotton. The cotton is cleaned in an alkali bath, to remove all traces of grease, and then all moisture is removed, and the cotton placed in air-tight cylinders to prevent it re-absorbing atmosphere. Rubber gaskets have to be used on these cylinders.

"There are, I am advised by competent authority, about one hundred and forty thousand men manufacturing explosives for use in the war, every one of whom is forced to wear rubber boots, coats, gloves, etc.

"The use of balloons in the war is well known to us all. Here again rubber is used extensively.



"The Zeppelin is filled with gas bags, which are made of rubber. The outer coat of the balloon is also covered with rubber. The Parseval and the Lebaudy are really immense gas bags, with balloonet chambers on the inside.

"But it is in the use of automobiles, ambulance cars, guns, trucks, etc., that the use of rubber comes into notice as to quantity. I have been at great pains to obtain figures as to the consumption of all the armies on the continent now at war, and it would seem that between three and four thousand tons of rubber goods are destroyed daily, and it is unquestionably growing larger. This winter hip boots will be used in the trenches. One firm in England received an order for 2,000,000 pairs, weighing about 7,000 tons. When

you consider the armies of other nations, you are astounded at the tonnage which must be in demand."

NATIONAL EXPOSITION MANAGEMENT ENTERTAINS CHEMISTS.

A notable gathering of well-known industrial chemists met at the Chemists' Club, 52 East Forty-first street, New York, Wednesday evening, November 10, 1915. The occasion was a dinner tendered by the management of the exposition, to discuss plans for the 1916 National Exposition of Chemical Industries.

Among those present were: Raymond F. Bacon, Charles H. Herty, Henry B. Faber, A. D. Little, E. F. Roeber, George D. Rosengarten, T. B. Wagner, L. H. Backeland, M. C. Whitaker, B. C. Hesse, Adriaan Nagelvoort and Charles F. Roth; also R. G. Hollaman and F. W. Payne, of the International Exposition Co., all of whom will serve on the advisory committee for the 1916 National Exposition of Chemical Industries to be held at the Grand Central Palace, New York, week of September 25, 1916. At this meeting Dr. Charles H. Herty was elected to serve as chairman of this committee for the coming year.

An advisory committee was selected, and preliminary plans laid for enlarging the size and scope of the coming exposition.

RED CROSS CANNOT SEND RUBBER GOODS TO GERMANS.

Presumably on the ground that they might be used for military purposes, Great Britain refuses to allow shipment to Germany and Austria of hospital supplies, gloves and blankets, there being a possibility of such goods being reclaimed and used in the manufacture of tires, of which the powers in question are in such urgent need. If, in spite of the assurance of Ambassador Gerard at Berlin, and the American Red Cross Society, that the goods would be used only for hospital purposes, the British authorities still refuse the right of shipment, the American Red Cross would naturally have to suspend such shipments to all countries.

Effect of the War on Chemicals and Compounding Ingredients.

TO those interested, it might seem that the war had made a special target of the rubber industries. In many directions prices have mounted, some of them pretty well skyward, and there are those in the chemical market that freely predict still higher prices. This is certainly not reassuring. Happily, there are sources of information that promise betterment in some important departments, but for the present the producer should be wary of chasing rainbows. On the whole, rubber manufacturers should not be optimistic as to quantities and prices.

A casual review of the situation today indicates that there are special ingredients that the compounder may have to abandon, and no time should be lost in seeking for reasonably satisfactory substitutes. In some cases this prospect is discouraging, particularly where the trade is using for certain goods in-

redients that have peculiar properties and rank way ahead of any second best. The research chemist will have his hands full, but perhaps the spur of necessity may bring abundant reward in the end. This is one of the phases of the situation, and is mainly, though not entirely, the consequence of a stoppage of foreign supplies.

Unquestionably the biggest factor in raising prices and reducing or cutting off needful materials is the military demand from abroad. Munitions and fighting tools generally make the heaviest drain, but there are allied phases of warfare that call for their portion, and one of these is in the medical requirements of this awful struggle. The rise in the cost of zinc oxides was immediately the outcome of the greatly increased use of brass. Millions upon millions of cartridges have been turned out for small arms and machine guns, and still larger

NORMAL PRICES VS. WAR PRICES. NOVEMBER, 1915.

Chemicals and Compounding Ingredients	Heavy Line Shows Normal Price. Light Line Shows Increase in Price	Normal Prices	War Prices
Acetone		\$0 12 lb.	\$0.30 lb.
Acetic acid, 28 per cent. ....		.02 lb.	.04 lb.
Aniline oil .....		.40 lb.	.60 lb.
Antimony, crimson .....		.38 lb.	.43 lb.
golden .....		.28 lb.	.65 lb.
Barium sulphate		40.00 ton.	95.00 ton.
Barytes, white		16.00 ton.	18.00 ton.
Basofor		105.00 ton.	115.00 ton.
Benzol .....		.30 gal.	.85 gal.
Carbon bisulphide .....		.06 lb.	.07 lb.
tetrachloride .....		.14 lb.	.18 lb.
Cautic soda 76 per cent.		2.25 lb.	5.00 lb.
Chrome, green .....		.76 lb.	.30 lb.
yellow .....		.14 lb.	.14 lb.
Graphite, flake .....		.10 lb.	.18 lb.
Lead, red oxide .....		.05 lb.	.07 lb.
white basic carbonate .....		.05 lb.	.06 lb.
sulphate .....		.05 lb.	.06 lb.
Litharge .....		.055 lb.	.07 lb.
Lithopone .....		.04 lb.	.07 lb.
Magnesia carbonate .....		.04 lb.	.14 lb.
Naphtha .....		.09 gal.	.17 gal.
Oil, pine .....		.60 gal.	.80 gal.
Orange mineral .....		.08 lb.	.10 lb.
Pitch burgundy .....		.035 lb.	.06 lb.
Prussian blue .....		.45 lb.	.115 lb.
Rosin		4.50 bbl.	6.25 bbl.
Rubber substitute, black .....		.07 lb.	.12 lb.
white .....		.10 lb.	.22 lb.
Shellac .....		.16 lb.	.24 lb.
Toluol .....		.40 gal.	4.25 gal.
Ultramarine blue .....		.07 lb.	.20 lb.
Waxes yellow beeswax .....		.32 lb.	.35 lb.
white beeswax .....		.10 lb.	.55 lb.
Ozokerite, black .....		.16 lb.	.45 lb.
white .....		.18 lb.	.65 lb.
Montan .....		.07 lb.	.23 lb.
Ceresin, white .....		.12 lb.	.15 lb.
Paraffin, 18° .....		.035 lb.	.045 lb.
Yellow ochre .....		.0125 lb.	.02 lb.
Zinc oxide, American .....		.055 lb.	.08 lb.
French process, green seal .....		.07 lb.	.31 lb.
red seal .....		.065 lb.	.30 lb.
white seal .....		.075 lb.	.31 lb.

brass cases have been needed for the various calibers of rapid-fire field pieces. Fixed ammunition, the shell and powder charge being put up in cartridge form, is essential to the quick-firing gun, both afloat and ashore, and only brass answers for these capsules.

Zinc oxide, also, now appears to be susceptible of military application. A very large dealer in New York received a short while ago a long-distance telephone call from Canada. The Canadian would-be purchaser desired zinc oxide, and expressly said he did not want it for use in the manufacture of rubber goods. When pressed for an explanation, he admitted that it was needed for a lacquer for the inside of shells. Again, zinc oxide was sought for mixing with a special coating for barbed wire destined for the European battle front.

Where certain raw materials are concerned that we have formerly, either in part or exclusively, obtained from foreign sources, the supply will continue to be uncertain or denied us entirely. This is not explained wholly by the maintenance of blockades, for the fact is, British and German shipping have been the principal carriers of many of these alien products, and neutral sources of supply are closed to us now or hampered in their deliveries simply because merchant craft are not available for this service.

Taking up in detail the principal chemical and compounding ingredients used in the manufacture of rubber, there is generally a unanimity of opinion as to the market of 1916, but in some instances the experts disagree, and we are stating the facts as they have been given us. We can only hope that where these authorities are not in accord, the turn of the market will be favorable rather than otherwise to the rubber manufacturer. However, as we have said before, optimism should be held in check.

VIEWS OF THE SUPPLY MEN.

ACETONE and ACETIC ACID, both wood distillates, will continue to advance. In the case of acetone, which is used largely as a solvent of gun cotton in making smokeless powders, it was impossible to get any spot two months ago, and it will probably remain scarce. The same situation prevails in the matter of acetic acid, and the outlook for lower prices for the consumer is most unfavorable.

AMMONIUM CARBONATE. There is apparently no reason why this should be scarce. Ammonium is used variously in the manufacture of explosives, but many of our steel plants and some of our gas works are saving this by-product; so the war demand is being met accordingly without affecting the general market.

ANTIMONY, CRIMSON and GOLDEN SULPHURETS. The situation is complicated in regard to these pigments. Shipments of metallic antimony from Europe have either been prohibited or stopped by blockade, and those from China and Japan have practically ceased because of the part that Japan is now taking in supplying Russia with munitions. It is said that certain consignments from China and Japan actually reached the Pacific coast and were then bought from the American consignees and dispatched at once to Vladivostok, reaching Russian ammunition makers via Siberia.

Imported stocks of both crimson and golden antimony are practically exhausted. Several domestic makers are producing acceptable qualities in an experimental way, but not in sufficient quantities to take care of the demand. Owing to difficulty in obtaining the raw material, prices of both crimson and golden antimony are high and will remain so until conditions governing the export of the crude material from China are radically improved.

BARIUM SULPHATE, precipitated, the base of which is bin-oxide of barium, is becoming scarcer each day. The European sources are practically cut off and almost prohibitory prices prevail.

BARYTES is likely to advance still further. Since the war be-

gan we have had to turn to Tennessee as well as Missouri for our requirements. Several domestic plants are now producing it and there is promise of ample supply. However, if the barium industry is to continue, it will need ample protection after the war. In connection with the matter of barium and barytes, blanc fixe should be mentioned now, being made from barium monoxide. Blanc fixe is at present worth \$100 a ton, and will probably go higher.

BENZOL. While we have heard much of late about domestic producers, intended to encourage us, still as a matter of fact no manufacturer of benzol is yet ready to quote fixed prices or to promise lower costs in the near future. Indeed, one manufacturer has quoted \$1.10 a gallon. The steel companies of the United States are now, by the husbanding of their by-products and the introduction of suitable apparatus, turning out 15,000,000 gallons a year, and this in contrast to the 3,000,000 gallons of benzol of the days before the war. But, unhappily, the part this plays in the making of modern explosives has resulted, nevertheless, in an inadequate supply. Prices are going up, and the ordinary user is seriously inconvenienced and likely to be more so. Only limited amounts can be now had on a year's contract, and that at 70 cents a gallon, while spot is quoted at 80 cents.

BETA NAPHTHOL is scarce because naphthalene, from which it is made, is hard to get. One of the biggest domestic producers has none for immediate delivery, but holds out hope for 1916. There are only two manufacturers here and the price may reach \$3 a pound.

BLACK HYPO. This product is not to be had at all.

CARBON BISULPHIDE. The American producers will probably be able to meet the demands, and the price should remain substantially unchanged.

CARBON TETRACHLORIDE. While we have two or three domestic producers in this field, still they can not supply the demand now that imports from England especially have ceased. The price will probably go up.

CAUSTIC SODA (76 per cent.), is high-priced now and an advance is predicted. Prices may range anywhere from 6 to 10 cents a pound. It is said that the present price is not justified by the available supply, but that it probably reflects that "sympathetic" rise which so often follows the advance of other chemicals. The Germans are using caustic soda extensively in the air-regenerating equipment which they supply for the men in the trenches handling the gas-making apparatus, and in the breathing equipments furnished to aviators and the escape helmets for the crews of submarines. Contracts are being made at 4½ and 4¾ cents in car lots for 1916 delivery.

CHROME GREEN and YELLOW will both be higher, owing to the scarcity of the basic materials from which they are made. Here we see the effect of the demands of the metallurgist and particularly of the steel mills engaged in the fabrication of war materials. Green oxide of chromium may go to 40 cents a pound.

GRAPHITE. The domestic crystalline graphite, commonly known to the trade as "flake," is more likely to increase than to diminish in price. Owing to the war, our usually big importations of graphite from Ceylon have been very much reduced, and because of hampered shipping we are not getting our accustomed supply from Corea. The output of the mines in Mexico, upon which we have drawn generously, has been curtailed by the disturbed conditions in that country.

IRON OXIDES. While the domestic resources are ample, the native products are not as good as those from abroad. The German supply is completely cut off and the English one is limited and higher in price because of increased cost of production.

LEAD OXIDES are all based on the state of the metal market, which is still advancing on account of the war. Here is where the destructive bullet hits reflexively the rubber manufacturers.

LITHARGE has advanced a quarter of a cent a pound lately, and there is a further upward tendency. The average level in 1916 will, unquestionably, be a high one.

LITHOPONE (30 per cent.) is becoming scarcer due to the advance of the zinc market. Very little is now imported, and none, of course, from Germany. Lithopone will probably advance from one to two cents a pound. The market is now firm at 7 cents on contracts for 1916, and plus charges, will bring it up to $7\frac{1}{2}$ cents a pound. For local distribution to small buyers the market price will range between $7\frac{1}{2}$ and 8 cents a pound.

MAGNESIA CARBONATE. There are four or five American producers who formerly had to almost beg for orders, but now they cannot take care of the business offered them, as the foreign demand is so great. It is being used in the making of explosives, and is employed as an inert "carrier" for nitroglycerin and the like in the manufacture of dynamite and its destructive kindred.

CALCINED MAGNESIA, the cheaper German grade, is advancing, and prices will be much higher.

MAGNESITE has heretofore come mostly from Greece, but this source of supply is now shut off. Pacific coast magnesite is not available in sufficient quantities to meet the demand, and the cost of transportation is high. This material is used in the making of refractory linings for steel furnaces and in the fabrication of crucibles, etc. The state of the steel market, in meeting the requirements of war, explains the magnesite situation. Prices will range between \$50 and \$60 a ton.

OIL, ANILINE. Owing to the new manufacturers here, prices now may be made on contracts for next year ranging from 75 to 80 cents a pound. Producers naturally want to cover the cost of their lately established plants, and are purposely keeping up the prices to that end.

OIL, PINE. The prices for this oil have been high because the turpentine plants in the South were shut down at the outbreak of the war. There is practically none of this in the market now and prices are advancing, ranging from 65 to 80 cents a gallon.

ORANGE MINERAL. At this writing, the price is 12 cents a pound, and there is every reason to believe it will advance.

PITCH, Burgundy, supply rapidly diminishing.

PRUSSIAN BLUE is going higher on account of the increased cost of domestic manufacture. A large dealer has declared that it is unwise to predict the ultimate price.

ROSIN prices are high, but it is quite likely that there will be a decline immediately following the arrival of the December crop. However, it is probable that an advance will again be made. The comparatively low prices here are due to the difficulty of shipping abroad, and the domestic users benefit accordingly. Rosin is employed extensively in the manufacture of a variety of munitions.

RUBBER SUBSTITUTES have gradually increased in price owing to the advance in the cost of oils, particularly rapeseed. The rise in rubber substitutes has been quite 25 per cent. since the outbreak of the war, and the future is decidedly problematical.

SHELLAC is gradually advancing, and is uncertain, like all other allied cord products.

SULPHUR CHLORIDE has been the object of an extraordinary foreign demand, and such, too, has been the case with bisulphide of carbon. Heretofore business has been refused by domestic manufacturers in the interest of American consumers. If, however, this available foreign business is covered, then the domestic consumer will undoubtedly face an advance in price. How long the American producer can withstand foreign offers at persuasive prices is a question.

SULPHURIC ACID is one of the hardest things to get in the chemical market today, and it figures importantly in a wide variety of industries. Prices are way up, and as much as \$200 a ton has already been demanded for spot. This situation intimately concerns rubber reclamation.

TOLUOL, pure. The market now ranges between \$4.50 and \$5 a gallon, and none can be had on contract until 1917. Some spot is available in varying quantities, due to excess of production over that estimated by the manufacturers. As long as the war continues the scarcity will probably prevail.

VERMILION, brilliant, will grow scarcer the longer the war continues, as German base colors are necessary to its production. The supply is now almost exhausted. American vermilion is equally affected by the conflict in Europe through the advance of the mercury market, mercury being extensively employed in making the widely used detonator—fulminate of mercury.

WAXES present an interesting situation. More yellow beeswax is used than white beeswax. The price now ranges from 25 to 40 cents a pound. For this natural yellow beeswax the wide world is being drawn upon—Asia, Africa, Australia, and practically all of the islands of the seas, and our importations are exceptionally large. The stocks have been well absorbed, so that prices have been maintained. We have taken care of European consumption in doing this. Ozokerite and montan, which are produced in Austria and Germany, are no longer coming to us and the supply is substantially exhausted. On a normal market selling at from 18 to 20 cents a pound we now have to pay as high as 65 cents for ozokerite. Montan selling ordinarily at from $5\frac{3}{4}$ to $6\frac{1}{4}$ cents a pound has sold recently at 25 cents. Ceresin is ozokerite wax refined and lowered in price by the admixture of paraffin. The price of ceresin will naturally depend upon the supply of ozokerite, and we can get no more of this until the war ends. Most manufacturers of paraffin are sold up three to six months ahead.

WHITING will probably remain about the same but with an upward tendency due to the higher cost of cliff stone—the advance there being the result of increased labor costs, coal, and the lack of barrels. The future price can not be safely predicted.

YELLOW OCHRE is to be had here from domestic deposits, but the product is of low strength. The best comes from France and the price is going up on account of the lack of labor and other economic consequences of the war. It is not unlikely that there may be an advance of a cent a pound.

ZINC OXIDES. As is well known, there has been a highly speculative market in these, and certain gradings, such as "XX Horsehead," have sold as high as 15 cents a pound. Of French process, green seal, there is practically no supply here. In fact, inquiries are now coming from abroad for all grades. Zinc sulphide, 30 per cent., is so scarce that one big dealer has said he does not know where any can be obtained. Certainly the outlook for the makers of white goods is a most unpromising one for 1916.

There are, however, a number of chemicals and ingredients that have not been affected by the war and are normal in price and quantity. For instance, talc, soapstone, aluminum flake, mica, asbestos and sulphur flowers are produced in this country and are cheap and plentiful. Asphaltum, lampblack, infusorial earth, tripolite earth, rotten stone are about normal in price and the supplies are apparently abundant for all purposes.

The complete and well-arranged catalog of the Scientific Materials Co., Pittsburgh, Pennsylvania, devoted to chemical laboratory equipment, has been received. It is fully illustrated and well indexed, and will be appreciated among chemists.

The Arthur H. Thomas Co., Philadelphia, Pennsylvania, publishes a large cloth-bound catalog of 579 pages supplemented with a 70-page list of reagents. The book is devoted to apparatus selected for laboratories of chemistry and biology in their application to education, industry, medicine and public health. As a reference book it will be appreciated in any laboratory.

What the Rubber Chemists Are Doing.

VULCANIZATION EXPERIMENTS ON PARA RUBBER.

IN the October issue of THE INDIA RUBBER WORLD there was given an abstract of a lecture by B. J. Eaton on "Variation in Rate of Vulcanization of Rubber." Since that date the authors' report of the original investigation has been published in the "Journal of the Society of Chemical Industry" (Vol. 34, pp. 989-999). The authors, B. J. Eaton and J. Grantham, chemists of the agricultural department of the Federated Malay States, have there recounted their investigations, with many tables and curves showing the relations between time of cure and vulcanization for various samples of rubber. Supplementary to the abstract of the lecture, mentioned above, the following summary of their results will be of interest.

1. Considerable variation exists in plantation Para rubbers from the same as well as from different estates.
 2. This variation relates chiefly to its rate of vulcanization, and not to its general mechanical properties, especially in the case of properly prepared "first latex" samples.
 3. Given the rate of cure under specific conditions, vulcanized rubber having similar mechanical properties can be made from all good samples of "first latex" rubbers.
 4. Differences in mechanical properties are greater between high and low-grade plantation rubbers than among first quality rubbers. Some rubbers never attain the maximum mechanical properties reached by others, whatever the period of cure adopted. These differences in the case of "first latex" rubbers are not so important to the manufacturer as the differences in rate of cure, and are not of the same order.
 5. The rate of cure is due to some non-caoutchouc substance in the latex, possibly protein or other organic constituent, or to some product derived from these substances, which acts as a catalyst and accelerates the rate of cure.
 6. This substance may be already present in the latex, or it may be subsequently formed there by decomposition and taken up by the rubber in variable quantity, according to the mode of preparation, or, alternatively, it may be formed in the coagulum in variable quantity, depending on the amount of serum remaining or the presence of preservatives which hinder or prevent its formation. These theories await investigation.
 7. Smoking, removal of excessive serum in the washing process, and preservatives are among the artificial factors which either hinder the formation of this substance or, if it exists in the prepared rubber, partially destroy it.
 8. The catalytic substance is probably not affected greatly by heat. Whether heat destroys it, or prevents its formation in the latex or partly coagulated rubber, awaits investigation.
 9. The rate of cure of a rubber under specific conditions is not indicated in any way by the mechanical or any other apparent properties of the raw material.
 10. Two alternatives are suggested to secure uniformity between rubbers from the same or different estates: (1) The issue of certificates giving correct rate of cure and mechanical properties at this cure; (2) the attainment of more uniformity by uniting the rubber from latex collected during a series of days into one ball or block, which may be described as the method of averages.
- Over three years ago (July, 1912), Messrs. Beadle and Stevens clearly showed, for the first time, that the removal of the nitrogenous matter from Para rubber resulted in slow-curing rubber, as indicated by low percentage of sulphur in "combination" with the rubber and poor physical qualities; while the excess of protein matter has the reverse effect. They particularly drew attention to the influence of the protein on the speed of vulcanization. They also pointed out the importance of their discovery

as regards the vulcanization of synthetic rubber. In subsequent papers Beadle and Stevens have shown that not only the nitrogenous matter, but also the resinous matter, affects the quality and speed of vulcanization of the rubber. [See reference in THE INDIA RUBBER WORLD, May, 1914.]

CONDENSATION PRODUCTS.

A very interesting paper on the condensation products of phenol and formaldehyde, with special reference to bakelite, by Goro Matsumoto, appears in the "Journal of Chemical Industry," Japan, Vol. 18, page 434 (1915). Mr. Matsumoto classifies these various products in three groups, namely, crystallizable, soluble and fusible, insoluble and infusible. His results on bakelite are thus summarized:

- (1) The whole process may be divided into three stages: the initial condensation, the concentration of the products, and the hardening. Reactions in all stages are accelerated by certain reagents.
- (2) The following may be used as condensing agents: sulphuric acid, hydrochloric acid, ammonium hydrate, sodium sulphate, sodium carbonate and sodium hydrate.
- (3) As a hardening agent only basic substances, as sodium hydrate or ammonium hydrate can be used, of which the latter is better.
- (4) The combination of sodium hydrate as the condensing agent and ammonium hydrate as the hardener gives the best results both in yield and quality.
- (5) With the use of cresol instead of phenol a similar substance is obtained.

TEST FOR BENZOL OR ALCOHOL IN HYDROCARBON MIXTURES.

The well-known German chemist, Dr. Fritz Frank, in a recent article mentions a method for the colorimetric estimation of benzol or alcohol in mixture with hydrocarbons of the paraffin series. The test is credited to Karl Dietrich, who obtained from dragon's blood resin a coloring material which gives a crimson color in the presence of benzol or alcohol. The test is made by means of "Diacorubin paper," which is impregnated with varying proportions of diacorubin resin in order to afford quantitative color reactions in a standard test volume of liquid.

RUBBER RESINS.

In a voluminous article, published serially in "Gummi Zeitung," Dr. F. Jacobsohn reviews the work of many authorities concerning the presence of resin in rubber latex and in various commercial grades of rubber. There seems to be much doubt as to the function of these resins in the plant economy, and not much agreement as to their effect in rubber other than that they seem to act as catalysts during vulcanization, and consequently are not advantageously removed except in the extreme case of Pontianac, where the resin content is the chief ingredient.

RESEARCHES ON AFRICAN RUBBERS.

F. Heim and others in the "Bulletin of Agricultural Intelligence," Vol. 6, 581 pages (1915), report investigation of the "Gohine" liane (*Landolphia heudelotii*), a source of rubber in French West Africa. The writers have analyzed two samples of this rubber from the Upper Senegal-Niger region and give data concerning strength, extension, nerve, elasticity and permanent stretch of these samples and also other samples from the same variety grown in different stations and prepared by various methods of coagulation. Compared with fine hard Para rubber had equal strength and greater resiliency and stretch. Three samples of rubber from French Equatorial Africa, known as "Owouina Noir" or "Andang," "Kondo" or "Pembe," and

"N'Caui," were analyzed by the authors, without knowledge of their botanical origin. But the data shows that "Owouina" rubber is interesting because of its great chemical purity, comparable to that of Para. "Kondo" rubber also appears to possess a fair technological value.

CHEMICAL TREATMENT OF RUBBER.

UNITED STATES OF AMERICA.

MOLDABLE PHENOLIC CONDENSATION PRODUCT. 1,146,299 and 1,146,300. J. W. Aylsworth.

VULCANIZATION ACCELERATOR.—1,157,177, S. J. Peachey. The invention relates to the use of Paranitrosec-dimethylaniline or its homologues to accelerate vulcanization of rubber, as mentioned in *THE INDIA RUBBER WORLD*, August, 1915.

RUBBER SUBSTITUTE.—1,159,257 and 1,159,258. Georges Nüth. These patents relate to the preparation of elastic rubber-like substances derived by the action of amines on ordinary sulphuretted fatty oil "substitutes" or "factices" and the subsequent vulcanization of the polymerized substances to various degrees of elasticity or hardness. These new bodies have high electrical insulating property. When dissolved in appropriate solvents they serve as adherent, flexible, transparent and brilliant varnishes. A long list of ammonia derivatives of the fatty and aromatic series is named as suitable for the formation of the new elastic bodies.

PROCESS OF VULCANIZING RUBBER.—1,159,327. Paul I. Murrill. This process relates to an improvement in the cold cure process of vulcanization by which the purity of sulphur monochloride is preserved against the deteriorating influence of atmospheric moisture. The improved process does not entirely prevent the decomposition of the sulphur monochloride but offsets it by other reactions whereby inert substances result. This is accomplished by adding to the sulphur monochloride, diluted with the usual inert liquid to adapt it for use, a quantity of metallic sodium. After standing about twenty hours the liquid may be used as a vulcanizing agent and the sodium will combine with the impurities.

UNITED KINGDOM.

VULCANIZING RUBBER.—12,661 (1914). Abridgment of October, 1915. F. Bayer & Co. The subject matter of this patent was referred to in a note on vulcanization accelerators in *THE INDIA RUBBER WORLD*, June, 1915. It relates to the vulcanization of natural or artificial rubber-like substances in the presence of such ammonia derivatives of a basic reaction, other than those that liberate free ammonia under the conditions of vulcanization, or such nitrogenous organic bases, other than piperidin or its homologues or derivatives of these bases, that possess a dissociation constant in aqueous solution greater than 1×10^4 . Examples of such bases are sodium amide, benzylamine, naphthyl-enediamine, quaternary ammonium bases, the addition product of ammonia and acetaldehyde and paraphenylenediamine.

PHENOL-ALDEHYDE CONDENSATION PRODUCTS.—28,187 (1913). Abridgment of October, 1915. A. Heinemann. In the production of resinous condensation products from phenol or cresols and formaldehyde or its polymers, the reacting substances are first heated without a condensing agent, yielding a liquid oxy-benzyl-alcohol, and this product is further heated in an open vessel with sulphur dioxide solution. The product can be rendered insoluble by further heating or treatment with a basic catalyst.

EBONITE SUBSTITUTE.—76 (1914). Abridgment of October, 1915. A rubber substitute is made by mixing minced animal tissue, such as sinews, after heating with an astringent solution such as zinc chloride or hydrochloric acid, with starchy matter, such as powdered tapioca. The dough thus formed, after drying,

is preferably mixed with a small proportion of rubber latex or a solution of rubber or resin, for example 6 to 12 per cent. of rubber dissolved in turpentine. The product is heated until tough and applied as a dressing to leather, canvas or other fibrous base.

RUBBER AND LEATHER COMPOSITIONS.—13,128 (1914). E. B. Cook. Leather reduced to a fibrous state is mixed with vulcanizable rubber compound on rubber mixing rolls and the product vulcanized by heat, for use as shoe soles, pneumatic tires, door mats and other tread surfaces. In an example $2\frac{1}{2}$ parts leather fiber are added to $1\frac{3}{4}$ parts crude rubber, 2 parts reclaimed rubber, $1\frac{1}{2}$ parts fossil flour, $1\frac{1}{2}$ parts litharge, $\frac{1}{4}$ part sulphur and lampblack or other pigment.

SYNTHETIC RUBBER. 297 (1915).—Dr. Hermann Stern, Karlstrasse 42, Munich, Germany. This invention relates to the production of hydrocarbons of the diolefin group, more particularly isoprene, caoutchouc and caoutchouc-like substances. The essential characteristic of the process consists in, or includes, the treatment of an aliphatic ketone or ketones with fuming sulphuric acid. The process in its simplest form consists in heating acetone or its homologues with fuming sulphuric acid. For example, if 500 grams of acetone are heated with about 350 grams of fuming sulphuric acid containing 18 to 20 per cent. of sulphuric anhydride, there results, after distilling off the volatile liquid products, and neutralizing the solid residue with an alkali, approximately 350 grams of solid caoutchouc-like substances. Similar substances are obtained if there is substituted for acetone, or used in conjunction with it, homologues, such as diethyl ketone, methylethyl ketone or propyl-brutyl-ketone.

THE FRENCH REPUBLIC.

RUBBER SUBSTITUTE AND PROCESS FOR MANUFACTURING. 476,396 (October 21, 1914).—V. Ottorepetz. (Same as British patent No. 21,524, 1914). See *THE INDIA RUBBER WORLD*, October, 1915.

RUBBER SUBSTITUTE. 476,509 (April 24, 1914).—J. de la Fresnoy and L. Aimond.

RUBBER SUBSTITUTE, PLASTIC, SEMI-PLASTIC OR HARD MATERIAL obtained by using human or animal hair, scraps of tortoise shell, leather, or horn, and process for manufacturing it. 476,578 (April 28, 1914).—G. L. Lussaud and R. Montois.

CONDENSATION PRODUCT. French patent 468,879. A. Labbé—Resorcinol, hydroquinone, pyrogallol, pyrocatechol and their derivatives are dissolved in formaldehyde in presence of very small amounts of dilute mineral acids which appear to act as catalyzers. The mass solidifies after several hours to an elastic product, the hardness of which increases with the dilution of the formaldehyde, and which can be rendered transparent by addition of acetone or glycerol to the formaldehyde. The product is permanent, fireproof and easily worked.

THE GERMAN EMPIRE.

PROCESS FOR HARDENING PLASTIC MASSES OF GLUE, GLYCERIN AND powdered fillers. 288,321 (June 23, 1914).—J. Traube, Am. Lützow, 130, Charlottenburg.

RUBBER SUBSTITUTE. PROCESS FOR PRODUCING SOLID PLASTIC masses. 288,347 (May 20, 1914).—Supplement to patent 274,176, Karl Hagendorf, Baufeld-bei-Fredersdorf Ostbahn and Dr. Adolf Breslau, Hektorstrasse, 13, Berlin-Ilensee.

RUBBER SUBSTITUTE. PROCESS FOR MANUFACTURING A substance specially suited for being worked into tires. 288,476 (July 22, 1913).—Murizio Baricelli, Nordstrand, near Christiania, Norway. Represented by R. Schmehlik and C. Sattow, Berlin, S.W. 61.

RUBBER SUBSTITUTE. PROCESS AND APPARATUS FOR MAKING plastic masses out of fibers and cements subjected to the action of sulphur, sulphur chloride and nitric acid on oil, tar and the like. 288,532 (Nov. 29, 1914).—Nicolaus Reif, Christuskirche 24, Hanover.

NEW MANUFACTURING PROCESSES.

UNITED STATES OF AMERICA.

INSULATED WIRE AND TERMINAL.—1,157,916, Arthur M. Wentworth, Pittsfield, Massachusetts, to General Electric Co., Schenectady, New York.

METHOD OF MAKING RUBBER FLOAT-BALL VALVES.—1,158,009 and 1,158,395. David Stephen, assignor to the H. O. Canfield Co. The upper half of the float-ball is stiffened by an internal disc of hard rubber, upon which the outer ply of soft rubber is cemented, carrying the metal insert for attachment.

PRINTING BLANKET.—1,158,033. Frank E. Ellis. A rubber surface blanket with textile plies and an insertion of a ply of sheet cork composition to secure softness and pliability.

BEAD FOR PNEUMATIC TIRES.—1,158,194, M. W. Fink and A. M. Kobiolke. A molded tire bead of rubber reinforced with internal longitudinal triangular strip of leather and with a leather cover for the body.

PNEUMATIC TIRE.—1,158,227. H. O. Johnson. The special feature is an endless chain of looped, metallic links, specially formed from steel plate. This chain is placed as a protecting band between the tire casing and the inner tube to prevent puncture of the latter.

ART OF MANUFACTURING FOOTWEAR.—1,158,389. W. E. Piper, assignor to Boston Rubber Shoe Co. An apparatus for cold pressing or molding, between flexible diaphragms, uncured rubber footwear on lasts, thus compacting the adhesive plies by expelling the contained air preliminary to vulcanization.

PRESSURE APPLYING APPARATUS FOR FOOTWEAR.—1,158,390. Chester J. Randall, assignor to Boston Rubber Shoe Co. The goods on lasts are supported in an adjustable bell-shaped tank containing air under pressure.

HOSE.—1,158,595. John J. Voorhees, Jr. A hose formed of a strip of spirally wound flat metal, with a superimposed ply of fabric and a cord spirally wound upon the outer surface to form inwardly projecting ribs between the spirals of the metal strip and a tube of rubber applied in close contact with the outer surface of the fabric. The ribs prevent movement of the spirals and contact between the metal and rubber, besides protecting it.

VACUUM TREATMENT OF COMPOSITIONS OF RUBBER.—1,158,843. Raymond B. Price, assignor to Rubber Regenerating Co. The process begins by incorporating a vulcanizing agent with vulcanizable plastics previous to their vulcanization. Then subjecting the mass during or subsequent to this addition, simultaneously to a kneading action and to the action of a vacuum, and finally subjecting the surface of the mass to a sealing pressure when enclosed in a yielding covering.

HOSE.—1,158,995. Richard J. Evans. A hose with tube and cover of rubber and bias-cut plies of asbestos fabric applied spirally.

EXTRACTION OF RUBBER.—1,159,137. Dominique Vecchini. The object is to successively reduce to an extreme degree of fineness shrubs and bark of rubber-bearing plants, in a specially designed machine, thus frictionally heating the rubber to an agglomerating temperature, without injury to its fibrous nature.

COATED FABRIC.—1,159,155. William G. Ayres, assignor to William Ayres & Son. A body or core of coarse burlap with a thick fibrous mass on one side and a thin fibrous mass on the other, these fibrous masses being connected to each other through the meshes of the burlap. A preliminary coating of rubber is applied to one face of the material to lay the fibers perfectly smooth, and a finish coating is then applied to the previously coated surface.

RESILIENT WHEEL.—1,159,218. Arthur Frederick Hawksley. Molded forms, with or without outer rubber covering, are built up with rubber impregnated cord and shaped to surround and protect resilient air tubes located around the inside circumference of a wheel.

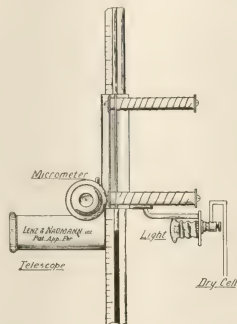
UNITED KINGDOM.

A NEW FABRIC IMPREGNATING PROCESS.—The fabric is submerged in the rubber solution and passed between rollers, which cause it to vibrate. This opens the threads so that uniform impregnation is obtained. [G. W. Beldam and A. U. B. Ryall, British patent No. 17,097—1914.]

LABORATORY APPARATUS.

IMPROVED MICROMETER READING DEVICE.

LABORATORY workers will appreciate the ease and accuracy with which the graduations of thermometers and burettes can be read by the Lenzmann micrometer reading device. This unique little instrument was publicly shown for the first time at the recent National Exposition of Chemical Industries in New York City. It was devised to meet a genuine need, and was first approved for use in the laboratories of the United States Bureau of Standards. The original form has been improved by the addition of a small electric lamp located so as to illuminate the scale and to render it more easily read. The "Lenzmann" differs from other reading devices intended for the same purpose. It consists of a combination of lenses, but, in addition, is provided with an adjustable lens with a very fine hair line through its center and



connected to a graduated micrometer screw in such a way that it may be moved across a certain space in either direction. This makes it possible to subdivide the space between any two graduation marks of a thermometer or burette into from two to twenty parts. The illustration shows a side view of the instrument clamped to a thermometer. The subdivision of the scale being observed is read from graduations on the face of a cylinder forming part of the milled thumb nut. [Lenz & Naumann, New York.]

ELECTRICALLY HEATED EXTRACTION APPARATUS.

A compact apparatus, suitable for general laboratory extractions in analytic work is shown in the illustration. It is of revolving type, mounted on an electrically heated base. It will accommodate any style of glass extractors, and any need for adjusting the corks on the tubes, in order to remove any part of the glassware, is obviated. The condensing tube slides easily through the cooling tank, thus enabling any flask or extractor, or both, to be removed from the cork and not the cork from the glass parts, as in other forms of support. There are no valves or washers used and it is impossible for the cooling tank to leak where the tube passes through. The water enters at the bottom, through the center column and down to the bottom of the condenser, the warmer water rising and overflowing through the central column to an outlet in the base opposite the inlet. This arrangement dispenses with the many rubber-jointed individual condensers, and their clamps, heretofore used. [E. H. Sargent & Co., Chicago, Illinois.]



"Rubber Machinery," Mr. Pearson's newest book, filled with valuable information for rubber manufacturers, is now ready for mailing. Price, \$6.

Modern Industrial Methods in the Rubber Industry.

W. H. Johnston, Jr.

NOT long ago a friend addressed the writer as follows: "Why doesn't the rubber industry in general put a more reliable product on the market? Usually I am obliged to stretch several rubber bands before I can get one that won't break, two out of every five auto shoes I buy have to be returned for credit, because they become unusable before the completion of their guaranteed mileage," and so on with water bags, syringe bulbs, shoes, and other rubber articles he had occasion to use. It was not any one make that he complained of, for he had tried many of the best, and although some proved to be more reliable than others, successive purchases of the best sooner or later proved their unreliability. A certain firm manufacturing apparatus for hospital use recently installed an expensive equipment, including several hundred feet of standard rubber tubing which they bought for the purpose directly from a well-known rubber factory. Within a very short time the tubing had become unusable. The rubber factory replaced the entire lot, but the results were just the same, and in both cases the cause of the trouble was laid to improper curing. Such experiences are only too common and have led to general condemnation of the rubber industry for its unreliable product and its backwardness compared with other industries.

The manufacturers meet these criticisms by claiming that the art of rubber manufacture is still comparatively young; that the nature of the product itself offers peculiar difficulties not found elsewhere because of the variability in the raw state and the changes which are likely to occur in the finished article after it is made; that they are spending large sums of money investigating and trying to eliminate these troubles; and, finally, that the many stores in which the product is sold and over which they exercise no control carry rubber stocks unreasonably long before selling.

To many of those who are acquainted with the manufacture of rubber articles, these claims are readily understood and appreciated; but they do not satisfy the present needs of the consumer, and it is a belief held by the writer, as well as by others, that the average rubber shop overlooks two very important weaknesses, namely:—

1. An absence of a high standard of mechanical practice and precision;
2. The use of empirical instead of scientific methods in the control of processes, and the handling of materials.

Comparisons of representative shop practice may make the first of these points clearer. Contrast, if you will, the usual methods employed in a machine shop with those found in a rubber factory even of the better type. In the former a workman is assigned a task on a machine—a milling machine, for instance—which makes one or more cuts under graduated control from any desired angle. The material upon which he operates and of which his cutting tool is made—tool or machine steel, hard or soft brass, or whatever it may be—is of practically uniform quality, not only from different sources of supply, but also in different purchases over considerable intervals of time. A clear understanding of what is expected of the workman is shown on a detail working drawing made in advance from a complete design, so that the result harmonizes with other work on the same or other pieces and is a part of a schedule of operations whose previous consideration, as a whole, assures the elimination of misfits and a standard quality which can be repeated as often as desired. Any experienced machinist who can operate the machine and read the drawing, can produce the same result. No change in the design is allowed without a reconsideration of the

whole by the designer. The judgment of the lower-priced machinist can have no effect upon the quality of the product so long as he adheres to the instructions on the drawing and the design and drawing are correct.

In the rubber shop, however, a workman does his work on a machine—a mixing mill, for instance—where the adjustments of heat application and roll spacing are not under graduated control. He puts on the mill the rubber and ingredients, which are usually weighed out for each batch in advance, adjusts the roll-spacing or gage, applies steam or cold water to the rolls, and handles the mixture in accordance with his sight, touch, and previous experience. He is given few, if any, written instructions to follow. Nor does the material which he works on act uniformly, even in different batches of the same kind of mixture. This may be because of quality variations in the crude rubber or other raw materials, or it may be caused by differences in previous treatment due to faulty workmanship or the different personal equation of a substitute workman. At any rate the mill-man takes the materials as furnished him and endeavors to work them into a condition which his experience tells him is about right. Other operations throughout the whole process, except possibly curing and vulcanizing, are carried on similarly; so that there is at best only an incomplete harmonizing of all operations as they affect the whole finished article. In some plants chemical and physical examinations are made to check the results of important operations; but although they indicate and save many defects, such tests are often difficult and of questionable reliability. In short, the maintenance of the manufacture of a rubber product of uniform quality, according to present practice, is very largely dependent upon the judgment and personal equation of the more or less experienced workman, rather than upon a high standard of mechanical practice and precision. The result is a product of variable quality, as might be expected.

It might be well to state here that the writer realizes that among rubber, as well as among other factories, there may be exceptions where a higher state of development obtains; but, unlike the others, the number of exceptions among rubber shops is comparatively small, as evidenced by the condition of the product on the market.

Thus far an endeavor has been made to indicate the absence of a high standard of mechanical practice and precision in the average rubber shop by comparing the present existing conditions with those of a modern representative of high development—the machine shop. Hereafter an attempt will be made to describe briefly a few of the better methods of handling materials and of controlling processes.

In any effort to standardize the rubber shop the first necessity is to eliminate as far as possible the effects of unavoidable variations in the crude rubber as it is now frequently marketed in small quantities by many different growers or estates. One of the best methods is to include always in each batch or millful a small quantity of the product of each of several of the same reliable growers in the same quantity ratio to each other. The more growers included the less will be the percentage content of each, and the less possible variation from standard quality by occasional failure to obtain the product of one or two of the usual growers. This may involve increased purchasing and weighing costs, but the resulting smoother manufacturing conditions, fewer defects, and more uniform quality of product will more than justify the extra expense. With the wild South American rubbers the same treatment can be applied to different brands or marks when the usual available quantity

of any one of them is insufficient. And just as plantation or estate rubber must be delivered in original containers, so shippers, brokers, and weighers must not put different brands and marks of wild rubber in the same shipping case. The attainment of these requirements is difficult now, but only because they are not generally insisted upon.

Other important ingredients of rubber mixtures should be similarly treated. Ordering by specification should be carried out as far as possible, and on all materials tests for approval should be made before acceptance for use. Then each accepted purchase should be assigned a lot number and where the tests on several different containers of the same purchase indicate important differences in quality, which the manufacturers cannot avoid, each quality should be treated as a separate lot with a letter suffix added to the original purchase lot number. It has been found most convenient to have an independent series of lot numbers, beginning with 1, for each kind and grade of material. Thus an accepted purchase of, say, sulphur would become lot 1, and differences in quality, if found in that purchase, would indicate lots 1A, 1B, 1C, etc. The next accepted purchase would become lot 2, etc. Cost and stock accounts may be kept on each lot or group of lots, as may be found most practical.

Not only purchasing and stock-keeping, but also manufacturing by individual lots, should be strictly adhered to. For products of repeated manufacture this involves the following:

ARTICLE CLASSIFICATION.

All rubber work may be divided into the preparation and manufacture of the following general classes of articles, each of which should be assigned successive lot numbers.

RAW MATERIALS:

- Dried Highland plantation *Hevea* rubber, lots 1, 2, 3, etc.
- Dried wild *Hevea* rubber, lots 1, 2, 3, etc.
- Zinc Oxide, grade 1, lots 1, 2, 3, etc.
- Zinc Oxide, grade 2, lots 1, 2, 3, etc.
- etc.

MIXTURE:

- Mixture 4 (i. e., formula No.) lots 1, 2, 3, etc.
- Mixture 22, lots 1, 2, 3, etc.
- etc.
- (A lot may contain any number of batches or millfuls.)

CALENDERED SHEET

- Calendered Mixture 4—18 (i. e., gage No.) lots 1, 2, 3, etc.
- Calendered Mixture 4—15, lots 1, 2, 3, etc.
- Calendered Mixture 30—18, lots 1, 2, 3, etc.
- etc.

FINISHED PRODUCTS:

- Lots 1, 2, 3, etc., for each kind, size and shape.

PACKED PRODUCTS:

- Lots 1, 2, 3, etc. for each different style and size of package of the same and different finished products.

The same raw material may be used in two or more mixtures, the same mixture may be calendered into two or more gages or thicknesses of sheet, and so on right through the complete classified list of articles, so that each article must be a separate manufacturing unit. The reasons for this will be more apparent later on.

LIST OF STANDARD OPERATIONS.

Each article should have its own complete list of operations or divisions of work, which are made in accordance with location, machinery, cost and other considerations, and there should be no deviation from this list in the manufacture of successive lots. Thus, in the preparation of a raw material we may have

- a. Ordering
- b. Testing
- c. Preparing (i. e., sifting, etc.).

The article is then considered complete, and put into stock for such use in one or more mixtures, as may be required. Its cost, ready for use, may be easily obtained.

Or, in making a mixture we usually go through the operations

- a. Weighing rubber and ingredients
- b. Mixing
- c. Refining
- d. Testing.

The article is then considered complete and ready for use in one or more calendered mixture articles. Or, finally, in making a finished product we may

- a. Make up
- b. Cure
- c. Finish (i. e., trim).
- d. Test.

An operation can be added to any list to cover the same kind of work that has to be done on almost every lot, or regularly upon only a few pieces or pounds of the same lot.

In contrast with the above, the list of operations in the usual rubber shop, when there are any at all, runs through the entire schedule of work for the complete process, from the sifting of only as much of the raw material as is immediately needed, to the final packing of the finished product. But it is generally conceded to be good economy to bulk as far as practicable all the same kind of work on the same article, which, in other words, means to sift at one time all the same lot of raw material, to mix at one time all the requirements of the same kind of mixture for a convenient period, etc. For this reason and also because of shop ordering, cost, stock, and other considerations, this detailed classification of articles and the lists of standard operations are very important; in fact, no complete plan of shop standardization can do without them.

UNIFORMITY CONSIDERATIONS.

It is customary in mixing a lot of mixture containing a number of batches to use up one lot of rubber or ingredients as far as it will go, and then to finish the remaining batches with one or more other lots. This may even happen with several different raw materials in the same mixture. Such a procedure ignores the possibilities that slightly varying qualities of the successive lots of raw materials may cause more or less important differences in the finished mixture. In other words, every batch of the mixture may not be of uniform quality. Of course, the standardization and testing of raw materials will diminish the chances of trouble, but the manufacture of few, if any, of the raw materials, especially colored pigments and rubber, has not as yet reached such a state of quality uniformity in successive purchases that this way of putting them together will produce the most uniform results possible.

There is a better method, and it requires only a small amount of additional advance laying out on paper. When two or more different lots of the same raw material have to be put into the same lot of mixture, they should be so apportioned that each batch throughout the entire lot of mixture will contain exactly the same proportion of each lot of raw material. Similarly, every pound of calendered sheet should be made identical with every other pound in the same lot by the previous blending of any different mixtures or different lots of the same mixture which are to be sheeted out. And in curing, any two or more lots of mixture or calendered sheet of which the pieces are to be made, should be so blended that every cured piece in the same lot should contain exactly the same proportions of the same kinds and lots of calendered sheet or mixture, and hence of raw materials.

This system of lot manufacture, involving thorough article and operation classification, is not so complicated as it might appear. Its successful installation does, however, require patience, practice, and experience, and until those who handle it acquire proficiency they are likely to want to revert to the old method, because it seems easier and because the new way appears to require extra effort for small and perhaps unapparent differences. But eventually, if they honestly maintain its integrity,

they will find that the most systematic method is really the easiest in the long run, and that not only its faithful maintenance permits the tracing of a complaint to an individual purchase of raw material, but—what is even more important and perhaps otherwise unattainable—its systematic procedure creates a more favorable shop condition in which there is greater economy, fewer irregularities and delays, and greater assurance of a more uniform final product.

Another important item in shop management that adds to the scientific or systematic handling of materials has to do with a method of determining the time of issuing and the quantities of shop and raw material orders. It has been called "periodic ordering," but it might more truly be named stock budgeting, for it requires the predetermination of possible manufacturing requirements over a convenient interval of time, and the bulking of the necessary shop and raw material orders therefrom. A three months' period has been found most satisfactory in one plant, but other shops may find a longer or shorter period of greater advantage. The essentials of its successful operation are to divide the year commensurately into periods, to use good judgment in the estimation of advance requirements from past records and future indications, and to carry the schedule through unaltered after the orders have once been issued. If a change is believed necessary after it is too late to make an alteration, a supplementary order can be put through as a special, or the deficiency—or excess—can be remedied in the planning of the requirements for the next period. Advance period estimates should be made to allow sufficient time for the washing and drying of crude rubber, the resting of mixtures, etc. The development of several periods has to be experienced before this method is completely installed, and in some shops it may require even longer to make adequate adjustments of stock, space, and equipment; but the method is very flexible in its application to wide variations in shop conditions, and its advantages, aside from those of financial budgeting, are steadier labor and shop conditions with the elimination of rushed and inactive intervals, because an advance knowledge of work to be done within a period makes possible a more economical assignment, the elimination of excessive stock, space, and equipment requirement with the resulting minimum investment of capital, and the steady and frequent production of a semi-perishable product with an advance knowledge of the expected dates of completion.

Lack of space in a general article like this prevents the explanation of other large betterments for the control and handling of raw materials, such as strict stock-room control and the routing of operations, and complete cost and overhead expense accounting systems with comprehensive monthly and yearly summaries. Suffice it to say here, however, that all these systems and methods have been worked out from a conception of Taylor's Scientific Management, partially applied to the rubber industry, and their superiority over present methods, or lack of methods, in the average rubber shop is in every way more economical and desirable.

When the handling of materials has been thus standardized and the materials themselves made as uniform as possible, then, and not until then, the control of processes can be improved. Rubber mills, calenders, and tubing machines can be successfully equipped with comparative temperature measuring instruments and roll-spacing gages so that the variables of heat and handling can be controlled and standardized for each kind of mixture with reasonable accuracy. Press curing in molds with both steam and temperature indicators has usually attained a higher standard of accuracy than other operations, but there is still much more room for improvement in the use of better presses and molds, and more adequate tools for ejecting and cleaning.

Open steam vulcanizing is usually controlled by clocks, steam gages, and pyrometers or thermometers. The steam experts say that pressure varies directly with temperature, and that with gages and temperature indicators of equal accuracy and sen-

sitiveness either instrument will indicate the true heat conditions within the vulcanizer. And yet the rubber worker knows that under the most uniform conditions and with the same temperature indication on either the gage or thermometer, he is obliged, for a good cure, to alter the time of cure to suit the use of "live" or "dead" steam; the former condition produced by a slightly opened exhaust valve to permit the continual escape of a small amount of steam and water, and the latter by an exhaust which passes through a steam trap. The rubber worker also knows that the curing directions in an autoclave where heat is externally applied to a sealed pot containing water are very different from those required for the same material in the same mold in the usual tank vulcanizer which is heated by the injection of steam through a valve with the ejection of water of condensation through a steam trap or slightly opened exhaust valve. The writer has yet to hear of a satisfactory scientific explanation of these phenomena and until it is forthcoming, the open steam vulcanization of soft rubber goods will continue to produce the present uncertain results, in spite of the strict observance of uniform conditions with which rubber manufacturers now endeavor to surround this important operation.

With materials and machines standardized, specific instructions can be worked out and put into concise form, so that the workman can follow them just as a machinist follows his blueprint or drawing.

It has been the writer's experience to develop and apply most of these suggestions for the betterment of rubber shop and product conditions, and the results obtained have more than compensated for the effort involved. One representative experience may serve to illustrate: In a calendaring operation a gang of eight workers were turning out an average of 400 units a day. They were experienced, and it was believed that only automatic machinery could lower the costs of the operation. Nevertheless, three years later, after the installation of most of the improvements above outlined and without automatic machinery, they were averaging 600 units per day, with one less worker—an increased production of 50 per cent. with 12 per cent. less labor. The more uniform quality of the material delivered to the calender, and the more favorable shop conditions, had resulted in fewer interruptions and in the production of a larger quantity of usable finished product.

It is the writer's firm belief that if these higher standards of mechanical practice and precision, with more scientific methods of controlling processes and handling materials, as above outlined, are adopted, it will be entirely possible to put many rubber articles on the market with a guaranteed advance date—molded in the article or indelibly stamped on fool-proof packages—which will tell positively just when the rubber manufacturer's responsibility ends, as in the case of the kodak film industry. It will then be the concentrated incentive of the manufacturer not only to endeavor to advance the date as far ahead as possible, but also to see to it that the product is so well made that under normal usage it will not have to be returned for credit before the expiration of the guaranteed date.

When such a condition shall have been reached, the rubber industry will be beyond the cause for the complaints of the present unhappy consumers of rubber products, and its position will be alongside of, and not behind, the higher developments of other industries. Such a consummation need not await the millennium, for its accomplishment by the industry, as a whole, but only the awakening of the individual rubber manufacturers to the opportunity that is before them.

RUBBER ENZYMES.

It is generally admitted that enzymes are the cause of the tack in rubber. Dr. Utté states that they can be destroyed by heating the latex or even the gum for 15 minutes at 176 degrees Fahrenheit.

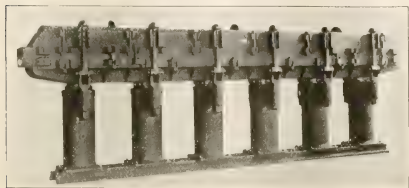
New Machines and Appliances.

TWO NEW ADAMSON MOLD PRESSES.

THIS hydraulically operated mold press, with swing bolts which may be quickly removed, shows a vast improvement over the ordinary hose vulcanizing press.

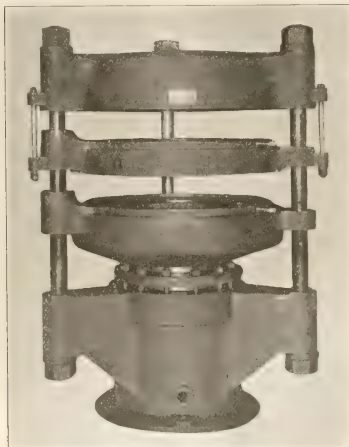
The machine, which is shown herewith, receives molds up to 24 inches in width and 20 or more feet in length.

In operation the top mold and platen, which are clamped together, are raised sufficiently to allow the operator ready access



to the lower mold. The lengths of hose, on their respective mandrels, are now placed into the cavities of the lower mold, the upper mold and platen are then lowered, and then the bolts are swung into position. Water under pressure is simultaneously turned into the 6 cylinders, forcing the rams upward and the two mold sections together, thereby exerting the necessary pressure on the hose. The steam is then turned on until the cure is complete.

The second illustration shows a new bicycle tire mold press operated hydraulically, with a swinging lower mold to facilitate the insertion or removal of the tire.

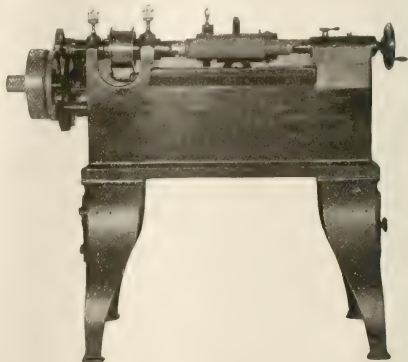


It may have a number of platens arranged one above the other, to any desired height. The lower platen can be swung out clear of the machine by the handle, as shown, and the tire mold

inserted. The platen and mold are then swung back into alignment with the upper platen, when the ram action is started. The upper platens have an opening to afford inflation of the tires when the press is closed. First, the lower platen will be forced up against the upper platen which, in turn, will force the lower platen of the next tier against its upper platen. The continued application of the ram will force tight joints, when the steam is admitted for curing the tires. [Adamson Machine Co., Akron, Ohio.]

WILLS' AUTOMATIC JAR RING CUTTING LATHE.

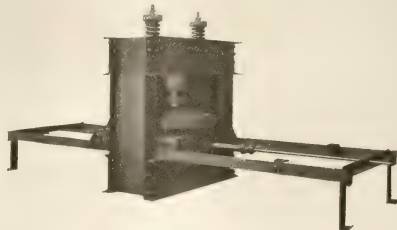
The special feature of this machine is an intermittent rotating star gear which controls the travel of the disc cutting knife and is automatically locked in position during each cut, thus in-



sureing uniformity in thickness of the rings produced. The illustration shows the assembled machine with a partly cut rubber sleeve on the mandrel. [United States patent No. 1,036,763. Arthur J. Wills, North Brookfield, Massachusetts.]

SOUTHWARK TIRE BEAD PRESS.

The illustration herewith shows a special type of quick-acting press for forming and shaping beads. The advantages of this



machine are explained in the following description furnished by the manufacturers:

"The moving table is controlled by air cylinders, thus permitting the table to be moved in and out of the work very quickly, necessitating the minimum amount of labor. The table is sufficiently long to permit the bead being taken out and a

new one inserted for pressing, while the press is doing actual work. The press is made entirely of steel castings instead of built-up beams and cylinders. A very low moving table makes it unnecessary to lift the tires, thus making handling easier. The ram is brought down to the work through idle stroke with tank water so that no power is required except for actual work. The press is controlled by a patented operating valve so designed that when the press is at rest the water is automatically by-passed." [Southwark Foundry & Machine Co., Philadelphia, Pennsylvania.]

THE C. C. PRESSURE REGULATOR.

Whenever it is necessary to use steam or air at a pressure lower than that of the initial pressure an automatic pressure regulating device is recommended. Such regulators are useful in rubber mills, particularly in connection with vulcanizers and dryers.

The C. C. Pressure Regulator, Type A, shown herewith, is a simple main valve operated by a piston under the control of an auxiliary valve. The adjustment of the auxiliary valve and the control of the service pressure are effected by a hand wheel which compresses a regulating spring.

The operation is as follows: To start the regulator turn the hand wheel 1 (Fig. 1) to the right, compressing the regulating spring 2. Diaphragm-hub 5 is forced inward, deflecting the diaphragm 6 which, abutting the stem of auxiliary valve 7, moves it away from its seat, allowing steam from the inlet to pass through drilled passage 8, through the auxiliary valve port, and on into annular groove 9. Connecting with this groove is drilled passage 10 (Fig. 2), through which steam passes to the top of piston 11. The piston 11 being of greater area than the main valve 12, the latter is forced from its seat, permitting steam to enter the service system.

The pressure in the service side of the valve is introduced into the chamber 13 (the inner side of diaphragm 6—Fig. 1) through drilled passage 14, shown in both Figs. 1 and 2.

When the steam pressure against the inner side of the diaphragm 6 is greater than the pressure of the regulating

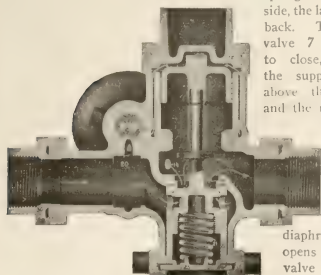


FIG. 2.

spring 2 on the outer side, the latter is forced back. The auxiliary valve 7 is permitted to close, cutting off the supply of steam above the piston 11, and the main valve 12 closes. As the service pressure falls, the regulating spring 2 again deflects the diaphragm 6, which opens the auxiliary valve 7, followed by the opening of the main valve 12.

The diaphragm 6 is really in a state of balance between two

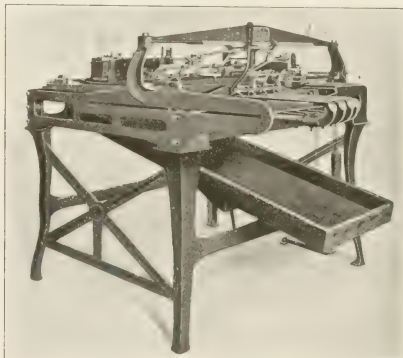
forces, the regulating spring 2 on the outer side, and the service pressure in chamber 13 on the inner side. The degree of compression of the regulating spring 2 determines the service pressure which is automatically maintained up to the capacity of the regulator. The service pressure is not affected by fluctuations of the initial pressure so long as there is sufficient excess of the latter to furnish the necessary operating power.

The dirt and scale usually carried by the steam is caught by the metal screen 20. [Crane Co., Bridgeport, Connecticut.]

REED POWER PATTERN GRADER AND CUTTER

Footwear patterns cut by hand are always imperfect and have to be carefully trued up, also by hand, before the binding edge can be put on. The power machine, illustrated herewith, operates with a pantographic movement, cutting and grading the patterns in one rapid operation, completely ready for the application of the binding edge.

The machine can be set for any size by an automatic mechanical device necessarily accurate and always uniform. Gage scales secure perfect and uniform grades which require no further al-



teration or filing. By the use of these scales, patterns may be reproduced by merely keeping record of the gage number on the pattern—thus allowing repeat orders to be easily filled.

The variety of work which may be accomplished includes keeping laps even on all sizes; grading difficult and stay patterns; locating eyelet holes and grading top facings. By using traces of different sizes, patterns may be cut out either of full size or with allowance for binding. The cutting mechanism consists of a punch and die, making 2,100 strokes per minute. The power may be furnished through belts or electric motors. Factories equipped with this machine should turn out a new set of finished and graded patterns in half the time now required. [Charles E. Reed & Co., Chicago, Illinois.]

MACHINERY PATENTS.

PRICE'S VACUUM CHAMBER TUBING MACHINE.

IN order to obtain rubber in a compact form free from air, moisture and gases, Price has invented this apparatus for the treatment of plastic materials.

The accompanying longitudinal section shows only one of the several ways in which the rubber may be fed to the cylinder A. The feed hopper D may be horizontal and diverted tandem, or feed rolls arranged in the hopper, or a feed plunger in the hopper used to force the material to the cylinder.

The material is fed into the hopper *D* and is forced by the stock worm *E* towards chamber *A*. When the material reaches the opening into the larger chamber *A*, it expands and is subjected to the direct action of a vacuum through one or more pipes *F*.

This removes all entrapped air, moisture and gases. An effectual seal is provided by the movement of the material in the hopper and in the large chamber *A*, thus allowing an efficient vacuum to be exerted. The material is then carried along by stock worm *B*, rotated by belt wheel *C*, to the discharge outlet *G*. [Raymond B. Price, assignor to Rubber Regenerating Co., United States patent No. 1,156,096.]

MACHINE FOR APPLYING NON-SKID STUDS.

Steel studs of leather non-skid treads are evenly spaced around the tread in three staggered rows by the machine illustrated herewith. Referring to the drawing—the hoop shaped template *A* has three rows of holes corresponding to the studs of the tread, and is supported by three rollers *B*. It is turned intermittently by a pawl that engages teeth cut on the inner periphery of the template. The lever *C* that moves the pawl rocks on shaft *D* through a cam on the driving shaft. The template *A* is adjusted transversely for a new row of studs by the eccentric sleeves of the rollers *B* operated by handles *E*.

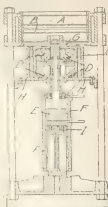
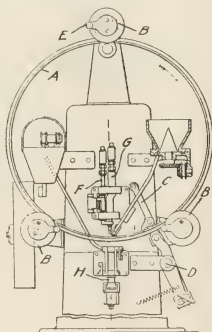
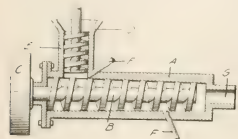
The leather tread is slipped on the template, which is then placed in the machine. The punch *F*, guided by the template, punches a hole, and a stud is brought forward and inserted from below by the plunger *H*. A washer, fed from above the template, is dropped over the stem of the stud, which is then riveted by the hammer *G*. [Dunlop Rubber Co., Limited, and F. J. Keegan, British patent No. 10,214, 1914.]

HYDRAULIC TIRE VULCANIZING MOLD AND PRESS.

In this process the tire cover is molded and vulcanized simultaneously by placing the cover, in the form of a cylindrical ring, in contact with a suitably grooved heated ring, and pressing it by radially moving segments.

In the illustration *A* is the ring, which is heated by making it a part of a steam-heated chamber, and *C* is one of the movable segments. When two or more tires are to be molded and pressed, either ring *A* may be grooved, or additional rings, as *B*, may be employed.

The tread segments are forced outwards by the toggle-joints *D*, joined to the piston *E*, working in the upper part of hydraulic cylinder *F*. The radial segments slide between the fixed parts *G* and *H*, and are attached to the cylinder *F*, which moves over a fixed piston *I*. The two pistons are separated by a diaphragm about two-thirds of the way up in the cylinder.



In operation, water under pressure is admitted above the fixed piston *I* to raise the cylinder *F* and press head, and when further upward motion is stopped by plate *H*, water under pressure is admitted under the piston *E* to straighten out the toggle-joints and compress the tire cover. [Dunlop Rubber Co. and C. Macbeth, British patent No. 11,732, 1914.]

OTHER MACHINERY PATENTS.

UNITED STATES OF AMERICA.

ISSUED OCTOBER 19, 1915.

- 1,157,117. Collapsible core. T. Midgley, Sr., and T. Midgley, Jr.—both of Worthington, Ohio.
- 1,157,118. Method of constructing collapsible cores. T. Midgley, Sr., and T. Midgley, Jr., both of Worthington, Ohio.
- 1,157,263. Tire core. E. E. Tannar, Akron, Ohio.
- 1,157,340. Repair vulcanizer. C. Taarud, Minneapolis, Minn.
- 1,157,420. Apparatus for making hollow rubber articles. F. T. Roberts, Trenton, N. J., assignor to The Arakon Co., Cleveland, Ohio. (See THE INDIA RUBBER WORLD, August 1, 1915, page 600.)
- ISSUED OCTOBER 26, 1915.
- 1,157,694. Process of insulating wire. O. T. Hungerford, Belleville, N. J.
- 1,157,751. Repair vulcanizing apparatus. J. W. Arthur, Warren, Ohio.
- 1,157,759. Dental vulcanizer attachment. T. T. Carter, Columbus, Kan.
- 1,158,278. Wrapping machine. W. B. Pierce and F. M. Pierce, assignors to Pierce Wrapping Machine Co.—all of Chicago, Ill.
- 1,158,284. Apparatus for splicing inner tubes. H. Radloff, New York, N. Y.
- 1,158,315. Vulcanizer. C. A. Shaler, Waupun, Wis.
- 1,158,405. Machine for wrapping coils of wire. F. M. Pierce and W. B. Pierce, assignors to Pierce Wrapping Machine Co.—all of Chicago, Ill.
- 1,158,406. Wrapping machine. F. M. Pierce and W. B. Pierce, assignors to Pierce Wrapping Machine Co.—all of Chicago, Ill.

ISSUED NOVEMBER 2, 1915.

- 1,158,506. Tire making machine. J. Koch and J. F. Zimmerman—both of Akron, Ohio.
- 1,158,509. Tube vulcanizer. F. W. Kremer, Rutherford, N. J.
- 1,159,138. Pulverizing machine. Dominique Vecchini, New York, N. Y., assignor to Franco-American Rubber Co., Wilmington, Del.
- 1,159,197. Repair vulcanizer. D. P. Einem, Springfield, S. D.
- ISSUED NOVEMBER 9, 1915.
- 1,159,646. Bead tool. F. F. Brucker, assignor to Miller Rubber Co.—both of Akron, Ohio.
- 1,159,792. Tire mold. G. F. Paynter, Philadelphia, Pa.
- 1,159,840. Tire building machine. W. H. Hermann, Lancaster, Ohio.
- 1,159,895. Machine for making tubes and tires. C. A. Cauda, Elizabeth, N. J.
- 1,159,947. Mechanism for winding insulated electric cables. G. A. Johnson, Newark, N. J.
- 1,160,075. Tire making machine. A. H. Harris, Youngstown, Ohio.

UNITED KINGDOM.

ISSUED OCTOBER 6, 1915.

- 14,388 (1914). Brush with bristles set in rubber. W. J. Mellers-Jackson, 38 Southampton Buildings, London.
- 14,390 (1914). Brush with bristles set in rubber. W. J. Mellers-Jackson, 28 Southampton Buildings, London.

ISSUED OCTOBER 13, 1915.

- 14,659 (1914). Devulcanizer. M. Chapel and J. Thiberville—both of 41 Boulevard de Capucines, Paris.
- 14,750 (1914). Testing golf balls. S. H. McQuown, "Watcoet," Park Road, Tauckham, Middlesex.
- 14,964 (1914). Tire building machine. F. C. Morton, 73 Dana street, Cambridge, Massachusetts, U. S. A.

ISSUED OCTOBER 20, 1915.

- 15,500 (1914). Tire making and vulcanizing press. H. J. Douchy, Edgebrook, Rhode Island, U. S. A. (See THE INDIA RUBBER WORLD, January 1, 1915, page 199.)

ISSUED OCTOBER 27, 1915.

- 19,2 (1914). Pressure regulator. A. Patos, 13 Fohedez Sándor utca, Budapest, Hungary.

ISSUED NOVEMBER 3, 1915.

- 16,134 (1914). Braiding machine. J. Lundgren, 3357 N. 15th street, Philadelphia, and Carlson-Venstrom Manufacturing Co., Dover, Del.—both in U. S. A.

THE FRENCH REPUBLIC.

- 476,642 (December 2, 1914). Improved pneumatic tire casing and a process and machine for manufacturing it. A. M. Kolmolek.

THE GERMAN EMPIRE.

PATENTS ISSUED (With Dates of Validity).

- 288,709 (March 6, 1912). Tire making machine. The De Laski & Thorp Circular Woven Tire Co., Trenton, N. J., U. S. A. Represented by M. Löser and O. H. Knoop, patent-lawyers, Dresden.

The Editor's Book Table.

DE TECHNOLOGIE DES KAUSCHUKS. BY DR. R. DOLL. (Ed. by Prof. A. Hattich, Vienna, Austria, and Leipzig, Germany.) (Hart, 886, 597 pages, 530 illustrations.)

THIS handbook, in German, on "The Technology of Rubber," is a valuable systematic collection of data dealing with rubber and rubber goods manufacture. The material has been gathered from many published and original sources. The author is proprietor of a government authorized testing laboratory in Graz, Austria, devoted to the technology of the rubber industry. He has thus had exceptional facilities for the study of the subject. The book embodies the results of factory and laboratory investigations of rubber manufacturing problems. The section on factory plan and equipment, as well as that on processes, represent the best current German practice.

The author states in his preface that the value of his book lies in the fact that the conclusions given were developed by combined studies of theory and practice modified by intimate personal discussion of the topics with practical rubber manufacturers, qualified as specialists to deal with technical problems.

The book has much value for the American manufacturer, particularly in the way of suggestion and comparison of methods.

Below is an outline of the subjects treated, condensed from the contents:

Tapping, gathering, coagulating and preparation of crude rubber, both wild and plantation.

Factory plans and equipment, including power, heating, drying and vulcanizing apparatus.

Reclaiming waste rubber and the manufacture and use of rubber substitutes.

Fabrics used in rubber manufacturing.

Rubber manufacturing machinery for various purposes, general and special.

Space is devoted to details of the manufacture of a large variety of hard and soft rubber goods, such as mechanical, footwear, druggists' sundries, thread, toys, proofed goods, tires, gutta percha articles, balata, belting and synthetic rubber.

OIL, PAINT AND DRUG REPORTER GREEN BOOK FOR BUYERS. September, 1915, edition. Issued semi-annually by Oil, Paint & Drug Reporter, New York. (Board covers, 160 pages.)

This useful guide is well along in its third year, and will, no doubt, be welcomed heartily by both old friends and new. It contains a comprehensive index, including the principal chemicals and compounding ingredients of interest to the rubber manufacturer, and gives the names and addresses of producers and dealers.

STOCK EXCHANGES (LONDON AND PROVINCIAL) TEN-YEAR Record of Prices and Dividends from 1905 to 1914. Frederic C. Mathieson & Sons, London, England. 1915. (Cloth, quarto, 496 pages.)

This is a work of substantially 500 pages, and appears now in its ninth issue; in fact, it contains cumulative data covering prices and dividends from 1905 to 1914.

To the rubber trade, the book is of interest because of the information which it gives in relation to British rubber companies, both manufacturing and planting.

The book has been described as the best and fullest work of reference of its kind in the world. It not only embraces all prominent securities in the various fields covered, but includes a great many of lesser importance. From the preface of this latest edition we quote the following: "The highest and lowest prices in this work being mainly of actual transactions officially recorded on all the different Stock Exchanges of the United Kingdom, the record for 1914 of this portion is necessarily only carried to the end of July, when the Stock Exchanges were closed and war was shortly afterwards declared; the dividends

paid, however, are to the end of the year, while notes have been made of the cessation of the number of interest payments. The re-opening of the London Stock Exchange on January 4, 1915, with generally lower prices than those current in the 'Stock Exchanges' Ten-Year Record,' calls attention to the advantages investors now have in being able to obtain higher yields for their capital.

"The rearrangement and writing-off of nominal capital, and the reorganization of companies, continued to be somewhat intricate in many cases, and 'splitting' shares with a higher nominal value into more shares of a lower denomination is still in favor. The attention given to these subjects over such a period as ten years must enhance the value of the tables, which have again increased in number."

RUBBER COMPANIES' POSITION. W. H. RICKINSON & SON, London, E. C., England. 1915. (Board covers, 96 pages. Annual subscription, 21s. postpaid.)

This relates to rubber planting companies in the Far East and summarizes the condition and prospects of 91 of them. To quote the editors: "Our object in issuing this handbook is to assist subscribers in forming as near as possible an idea of the present and immediate future position of a company, and the advisability or otherwise of extending or curtailing the field of their investments. The particulars given as regards capital, planted acreage, monthly output, etc., are extracted from the latest reports, balance sheets and circulars issued by the various companies."

VAN NOSTRAND'S CHEMICAL ANNUAL FOR 1915. EDITED BY John C. Olsen, A.M., Ph.D. D. Van Nostrand & Co., New York. (Leather covers, 669 pages.)

This is a valuable compilation of chemical information presented largely in tabular form for convenient reference. There are 116 tables, grouped in several sections, such as general tables of atomic weight, physical constants of the elements, factors for calculation of indirect gravimetric analysis, etc.; calculation of volumetric analysis and gas analysis; physical constants of chemical compounds; specific gravity tables and alcohol tables; equivalents of weights and measures; thermochemistry and stoichiometry.

RUBBER IN NETHERLANDS EAST INDIA. NETHERLANDS-EAST-Indian-San-Francisco Committee of the Department of Agriculture, Industry and Commerce. J. C. T. Van Dorp & Co., The Hague, Holland. [Paper covers, 12 pages. Illustrated.]

This is a very brief and interesting review of rubber cultivation in Java and Sumatra. It gives a good idea of the developmental work in connection with plantations, together with an account of the rubber trees that have given the best results under cultivation there. The growing of the Palaquium for the extraction of gutta percha, which has been treated at length in various papers, is here summarized.

TWENTIETH CENTURY RUSSIA AND ANGLO-RUSSIAN REVIEW. John Bale, Sons & Danielsson, Limited, London, W., England. [Paper covers, 83 pages. Price, 1s. net.]

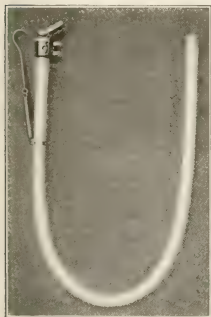
This is a new quarterly, the aim of which is to give the English-speaking public an intimate idea of Russia in her modern phases.

The land of the Czar has been a closed book, and few realized its nature and needs. A magazine, therefore, that will help the English-speaking world to a better understanding of this vast realm, and its commercial opportunities should certainly be of present interest and value. Of the many papers of interest in the initial number one may be mentioned as typifying the whole, and that is "The Future of Russia as a Trade Center." The new journal, through its excellent beginning, gives promise of taking first rank among the world's reviews.

New Goods and Specialties.

THE HIGHEST PRICED RUBBER TUBING IN THE WORLD

THREE-QUARTER inch rubber tubing at a little over \$6 a foot indicates something of greater value than the ordinary squirted compound of zinc oxide and rubber. A trifle over that price is charged for the patented electric warming tube shown in the accompanying illustration.



The tube is used with a special inhaling apparatus. It is built in plies, the rubber wall being only an eighth of an inch in thickness. Between two of the rubber plies is an inner coil of copper wire through which an electric current is passed. This heats the gas before it reaches the patient, thus bringing it to exactly the temperature of the human body. Between the outer plies of rubber is another coil of piano wire which makes it impossible for the tube to kink. [The S. S. White Dental Manufacturing Co., Philadelphia, Pennsylvania.]

NEW FEATURES IN THE "PERFECTED" DATER.

A rubber date band radically different from anything of the kind hitherto used in dating stamps has been introduced in the "Perfected" Lock Band dater illustrated herewith. These bands are of the type-block variety, with the blocks a trifle lower than usual, and each character is molded with a small air cavity, making it in effect a miniature pneumatic cushion. The bands are non-stretching and are made without woven fabric of any kind, their reinforcement consisting of fish-line silk and the joining of the ends being effected by means of a metal clasp which engages the center of the silk.



Several other features of the dater represent improvements in design and construction, included among these being the method of moving the date band. This band is turned by a toothed drum operated by a finger button on the side of the handle. Each dater is also fitted with a regular full thickness air cushion. [The R. H. Smith Manufacturing Co., Springfield, Massachusetts.]

THE "MADERITE" TENNIS BALL.

In order that a tennis player may make his strokes tell certainly, each ball must respond to those strokes in a like manner. To obtain this uniformity the greatest care must be used throughout the entire process of making the ball—in molding the core, gauging the weight, etc. An unusual degree of this valuable quality is claimed by the manufacturers for "Maderite" tennis balls. The highest grade new rubber, tested by chemists in their laboratory, forms the core. Felt of the correct weight and of a specially resistant quality, newly discovered, is used for the cover and firmly gripped to the surface of the core at every point. When complete, each ball is tested in every way before leaving the factory, and fully guaranteed. The manufacturers are receiving excellent reports from this new ball, which is evidently destined to be popular. [The Seamless Rubber Co., New Haven, Connecticut.]

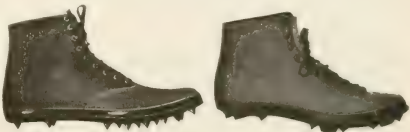
CANADIAN CONSOLIDATED FOOTWEAR

In the family bathroom, the youngsters are apt to be over-vigorous in their ablutions and splash the surroundings generally, as well as themselves in particular. The "Happy Thought"



bathroom slipper is probably the idea of some long-suffering paterfamilias. It is made of waterproof duck, in men's sizes only, and is thoroughly practical and inexpensive.

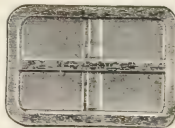
A sport shoe especially popular for running is called the "Sure-foot Balmoral." It has black rubber foxing, a rubber sole and rubber cleats. The top is made of dark tan leather, and the shoe is reinforced with ankle pads and has a leather insole and counter. A feature of the "Marathon Balmoral" which makes it an exceptionally satisfactory shoe for athletics is the solid rubber



spiked sole. It has all the advantages of the steel spiked shoe, with none of its detrimental effects. The rubber spikes do not tear up the turf on the putting greens of the golf course, nor scratch the floors of the clubhouse when one enters after the game. This shoe is made in the Bell vamp pattern, with blue, black or tan duck tops, as desired. It also has leather insoles. [Canadian Consolidated Rubber Co., Limited, Montreal, Canada.]

A WATERPROOF FOLDING SEAT.

The dampness of the English climate makes sitting on the ground at any season of the year a foolhardy proceeding. In this waterproof, woolen-lined seat, which can be folded up and put in one's pocket, however, the traveler, the sportsman, and also the ordinary citizen in the British Isles will find a most convenient, comfortable and helpful device.



Incidentally, other countries, notably our own, have damp days. [The Altrincham Rubber Co., Altrincham, England.]

ALL RUBBER HEEL LINER.

The "Nu-Grip" heel liner here shown no doubt makes good the promise of its name. The non-slipping quality of rubber when in contact with dry surfaces is well known, and this



device is made entirely of rubber, the surface intended to lie next the stocking being checked to further insure the grip. It is shaped to fit the back of a low-cut shoe, and is attached by applying rubber cement to its smooth surface and to the counter of the shoe. After allowing five minutes for drying, it is simply placed in position and pressed firmly against the counter. The "Nu-Grip" is supplied in several sizes, for both men's and women's shoes, in

either tan, black or white. [The Scholl Manufacturing Co., Chicago, Illinois.]

RUBBER GOGGLES FOR PROTECTION AGAINST GASES AND ACIDS.

With the exception of the lenses, which are held in a special groove of the eye cup, and can be readily removed, these goggles are made entirely of rubber. They are of one-piece construction, can be easily cleaned, are dust and rain proof, and



light and sanitary. They afford complete protection to the eyes, and yet are

sufficiently ventilated to be worn with comfort. Chemists, or other persons working amid gases, acids, fine dust, etc., will find them particularly valuable. An elastic head band, adjustable to any size, holds the goggle firmly and comfortably against the face. [T. A. Willson & Co., Inc., Reading, Pennsylvania.]

THE "MONKEY GRIP" RUBBER SOLE.

A feature which renders the rubber sole here illustrated of especial value in athletic sports, and upon slippery pavements, is the oval-shaped raised design covering the ball of the foot, and

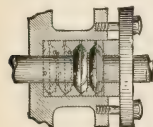


provided with flat-ended studs which lend the clinging quality suggested by the name, "Monkey Grip." This sole is a particularly satisfactory substitute

for the spiked shoe often worn on the golf links, which ruinously tears up the turf on the putting greens. It is made of very tough-fibered rubber, and the manufacturers claim it gives exceptional service. When worn in combination with the "Monkey Grip" heel, which has U-shaped ribs and flat-ended studs forming a non-slipping bottom, the wearer is well equipped for the most unfriendly elements or strenuous sports. [C. J. Bailey & Co., Boston, Massachusetts.]

A RUBBER AND METAL PACKING.

It has always been a difficult matter to obtain a metallic packing which can be installed without making changes in rods or boxes. This problem has been solved by "Noheet"



metallic packing, a patented article made by the Lubricating Metal Co., 2 Rector street, New York.

"Noheet" metallic packing is made of alternating rings of "Noheet" bearing metal and rubber, and is so constructed that in use the metal, not the rubber, is forced into contact with the rod. The metallic rings

are made to fit the various sizes of rods, thus doing away with extra work of installation.

It is especially adapted to ammonia pumps, steam piston rods and valve stems, oil pumps, chilling machines, air compressors and packing service of every description.

A new porcelain mogul-base socket, equipped with $\frac{3}{8}$ -inch or $\frac{1}{2}$ -inch aluminum caps, as desired, has a rubber gasket which makes the joints between the upper and lower portions absolutely tight and therefore weatherproof. [Harvey Hubbell, Inc., Bridgeport, Connecticut.]

A new shoe designed for the outdoor worker, and labeled the "Workshu", has rubber soles, and canvas uppers of the same fabric as that used in automobile tires. A very comfortable shoe is thus furnished at a moderate price. [Amherst Boot & Shoe Co., Limited, Halifax, Nova Scotia, Canada.]

HARD RUBBER HANDLES.

Umbrella and parasol handles in simple and ornate designs are being manufactured by the Hanover Vulcanite Co., the well-known German makers of hard rubber specialties, soft rubber toys and novelties. The illustration shows one of the more ornamental handles, which has a panelled recess on either side, one containing a neat bevel plate glass mirror and the opposite a small comb. Other patterns include mirror only. A large variety of the usual straight or bent forms are shown, all more or less ornamented. [Geo. Borgfeldt & Co., New York.]

**THE "EBONITE" BOWLING BALL.**

Bowling balls made of hard rubber throughout are, of course, not an entirely new thing, but this particular ball is a recent product, specially constructed, the company claim, to give life-long service, without cracking or splitting, and to roll accurately. It is made in four sizes: Small size, $4\frac{1}{2}$, $4\frac{3}{4}$ and 5 inches in diameter, the large size, 27 inches, weighing 14, 15 and 16 pounds. The trade mark encircling the holes of the ball is in the form of a red dumb bell. [Stowe & Woodward Co., Newton Upper Falls, Massachusetts.]

COMBINATION SHAVING AND MASSAGE BRUSH.

The rubber massage brush attached to this shaving brush provides a handy contrivance for softening the beard when shaving. It is intended to be used after applying the lather. Also, if used after shaving, it stimulates the circulation and tones up the skin. The bristles of the shaving brush are also set in rubber, measure $2\frac{1}{4}$ inches in length, and are made of fine white or mixed badger hair. [Montgomery Ward & Co., New York.]

**GUN BRACKET WITH RUBBER HOLDERS.**

A new gun bracket, called the "Universal," for use in hunting duck from a boat, is provided with U-shaped rubber holders which protect the fine finish of the gun as it rests between them. The bracket is attached to the boat in a position which allows the gun when not in service to swing freely, with muzzle pointing upward and in the direction the boat is going. It is thus ready for immediate use, and there is no danger of shooting a hole in the bottom of the boat. [New Process Specialty Co., Milwaukee, Wisconsin.]

INFANTS' ALL RUBBER TRUSS.

This is a bandage used for cases of umbilical or navel hernia in infants and youths. If put on a baby soon after birth it avoids all danger of navel rupture. The sponge rubber pad is velvety in texture, and will not slip. It is provided with a button in the center and a small strip of rubber at one end. The narrow rubber belt has several holes, allowing for adjustment as to size, the proper hole being stretched over the center button and the end of the belt being passed through the rubber strip in the manner of a buckle. To clean this truss it is only necessary to dip it in hot water and press it in a towel or cloth [Akron Truss Co., Akron, Ohio.]

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

Rubber Toys for the Holidays.

RUBBER toys for the holidays present new variety this season, attributable in no small degree to the enterprise of American rubber manufacturers.

As usual, the hand-made German toy animals are works of art. This year there are some notable additions in this line, offered by George Borgfeldt & Co., the well-known New York importers. The very latest German toys follow military models, as a natural consequence of the dominating conditions in Europe. These, however, are not obtainable in the American market today, although there is no shortage of German and Austrian toys.

The Mechanical Rubber Co., Cleveland, Ohio, is making a special feature of white rubber toys. Special claim is made for these goods that they are absolutely free of all soluble, injurious pigments or other deleterious matter; consequently are perfectly suitable for the use of the youngest children, whose chief pleasure is in mouthing their toys.

Particularly attractive is the line of toy balloons, inflated balls and "Rubber Bubbles" of the Faultless Rubber Co., Ashland, Ohio. The balls are made both in solid colors and in parti-colored bandings. The surfaces are printed with a variety of human and mechanical figures and various decorations of wild and domestic animals and comic faces. "Rubber Bubbles" are a substitute for soap-bubbles. They are thin rubber balloons in attractive colors, provided with inflating pipes and self-closing valves for retaining the air. Still another novelty in inflatable toys is the pocket punching bags. These are good-sized, stout wall, decorated balloons made with self-closing valve and provided with elastic cord and handle.

The illustrations show the attractive and appropriate Christmas designs and verses with which the holiday balloons are ornamented. They are particularly suitable as tree decorations and guaranteed to delight the heart of any young American.



BALLS AND BALLOONS OF THE FAULTLESS RUBBER CO.

Made in Red, White, Blue and Other Colors, and Are Fine Examples of Artistic Dipped Work.



MECHANICAL RUBBER CO.'S WHITE TOYS.

Non-Poisonous and Very Artistic.

TOYS HANDED BY GEORGE BORGFELDT & CO.

Made chiefly of Portland Reds, Except the Kewpie, Which Is White with Moulded Yellow.

The Obituary Record.

GEORGE E. MELIUS.

GEORGE ESLEY MELIUS, vice-president and treasurer of the H. O. Canfield Co., Bridgeport, Connecticut, died at his home in that city on October 28, after several months illness, at the age of 57 years.

Born in New York City and educated at its public schools and at the College of the City of New York, which conferred on him the degree of Bachelor of Arts, he took up the study of medicine, which he followed for two years before deciding that he did not wish to be a doctor. In 1885 he accepted a position as book-keeper for the H. O. Canfield Co. and remained in the service of that corporation for the rest of his life, except while United States deputy collector of customs in 1900. His advancement with the company was steady and progressive until he finally became its vice-president and treasurer.

A member of the Algonquin Club, the Seaside Club, the Commercial Travellers' Association, the Bridgeport Business Men's Association (of which he was for a time president) and a thirty-third degree Mason, he took an active interest in the affairs of these organizations and enjoyed the esteem of his fellow members and of his business associates. He is survived by his widow and one daughter.

Mr. Melius had hundreds of warm friends, both in and out of the rubber trade. He was a man of fine presence, cultured, witty and sympathetic. The business community in Bridgeport in particular and the rubber trade in general suffer a great loss in his untimely demise.

ISAAC L. RICE.

Isaac L. Rice, who prior to his retirement from business about two years ago was actively engaged in various manufacturing interests, including the rubber industry, died suddenly of heart disease in New York on November 2, 1915, at the age of 65 years.

He was born at Warenheim, Bavaria, and came as a boy to this country with his parents. After attending the Central High School in Philadelphia, Pennsylvania, he entered the Columbia Law School in New York, and graduated *cum laude* in 1850.

His entry into the business world was made in 1886 as counsel for the Southern Railroad. He was afterwards foreign representative of the Philadelphia & Reading Railroad and was subsequently identified as president with many important manufacturing interests. He was chairman of the Board of Directors of the Consolidated Rubber Tire Co., afterwards changed to the Kelly-Springfield Tire Co., and for a number of years president of the Buckeye Rubber Co., a subsidiary of the Consolidated Rubber Tire Co., and was instrumental in the erection of its plant.

An enthusiastic chess player, and inventor of the "Rice gambit," he was a member of the Manhattan Chess, Rice Chess and Brooklyn Chess Clubs in this country, as well as of the St. George's Chess Club and City Liberal Chess Club of London, England, in addition to his membership in the Lawyers', Lotos, Automobile and Harmonic Clubs, and rounded out his active career by publishing "What is Music?" and contributing many articles to the leading magazines.

Mr. Rice is survived by his wife, whom he married in 1884, and his family, consisting of two sons and four daughters.

Mrs. Rice, on behalf of herself and children, has donated \$1,000,000 to found and endow a model hospital for convalescents, in New York, to be known, in memory of her late husband, as the Isaac L. Rice Hospital for Convalescents. The idea was entertained by Mr. Rice before his decease, and plans for the buildings had already been prepared.

PHILIP W. PRATT.

Philip W. Pratt, founder of the Elastic Tip Co., died in New York on the 20th of November.

Seventy-nine years ago Mr. Pratt was born in Abington, Massachusetts, receiving his education at its public schools and at Phillips-Exeter Academy. He entered the lumber business in Abington, but gave it up as uncongenial, and being of an ingenious turn of mind had invented a rubber tip for crutches, chair legs, etc., which he determined to place on the market. He invented several other tips of different designs for similar purposes, and drove about the country with a horse and wagon selling his goods. An arrow tipped with a vacuum cup that caused it to adhere to the target at which it was aimed, the invention of a man named White, of Philadelphia, having attracted his attention, he purchased the right to its use and invented a pistol to discharge it.

About 1870 he went to Boston and renting a small office, carried on the business of manufacturing his specialties there. The business was removed about 1880 to Atlantic avenue where, as the Elastic Tip Co., it is still conducted.

He continued in the meantime his inventive endeavors, the last of which were mostly improvements on the rubber and fabric inventions of Rolon E. Foster. He went with the Foster Rubber Co. in 1903 and was identified with them up to the time of his death.

Besides his elastic tip inventions, rubber heel plugs and machines for impregnating the cloth of which they are made occupied his attention and were the subject of several patents issued to him. One such patent was on an elaborate machine which took fabric from the bolt, impregnated it with rubber and passed it backward and forward under an exhaust fan until dry, so that it could be rolled up at the other end of the machine. One of these machines was in successful use at the Walpole Rubber Co.'s factory. The fabric thus treated was used in making the plugs in the friction plug heels on the market.

From the anti-slipping heel to the non-skid tire was but a rational step. Mr. Pratt took out several patents on tires using these plugs, while in others the fabric was built in a sort of staggered, pyramidal form to prevent slipping. While none of these tires were placed on the market negotiations were in progress for their manufacture at the time of his death.

Mr. Pratt married Sarah Louise Hunt, of Abington, and of their several children but three reached maturity. One was the late D. S. Pratt, president of the Foster Rubber Co., who died in March, 1913. The only living son is Benjamin H. Pratt, sales agent for the Fisk Rubber Co., at San Francisco, who was on his way back to the Pacific Coast after a visit of inspection at the

company's factory when he was halted at Worcester by the news of his father's death. A daughter married George A. Stetson, president of the Elastic Tip Co., Boston.

PHILIP JAMES KING.

At the age of 75 years, Philip James King, famous as a designer of balloons, who is said to have created the first balloon that crossed the English Channel and was the originator of the "fish balloon," the forerunner of the modern airship, died last month in a suburb of London.

DIETRICH MUSHORN.

After being for nearly half a century connected with the Eagle Pencil Co., New York, Dietrich Mushorn died at his home in the Cypress Hills section of Brooklyn on November 10. Deceased was born in Oldenburg, Germany, 71 years ago, and is survived by his widow, three sons and three daughters.

JUSTUS S. HOTCHKISS.

One of the oldest and best-known retired merchants resident in New Haven, Connecticut, Justus Street Hotchkiss, died at his home in that city on November 12, aged 84 years. Prominent for many years in banking circles, he was also largely interested, as a stockholder, in rubber manufacturing companies, one of his cousins being Henry L. Hotchkiss, president of the L. Candee Rubber Co., New Haven. The will of the deceased disposed of an estate of about \$2,000,000, a liberal share of which he distributed among relatives and faithful servants and to local institutions. As residuary legatee, Yale University will receive nearly \$1,000,000, which will be divided in equal amounts between the academic, law and logical departments, without restriction.

LOUIS GOTTSCHALK.

Louis Gottschalk, F.R.S., an expert chemist who made a special study of the synthetic production of rubber, died last month at his residence, Newark, New Jersey, aged sixty-seven years.

Deceased, who was educated at the University of Munich, Bavaria, devoted much time to the study of the production of synthetic rubber, using some highly explosive ingredients in his process. Two years ago an explosion occurred in his laboratory at Sewaren, New Jersey, by which his wife, who was greatly interested in his work, was fatally injured; and not long afterwards a second explosion resulted in the death of his son-in-law. He had finally succeeded in replacing the explosive chemicals with others of a less dangerous character and received the patents on his process shortly before his death.

RUBBER-SOLED SHOES POPULAR AT KARACHI.

The American consul at Karachi, India, in a recent letter, comments on the rubber-soled canvas sport shoe extensively worn in that district for every purpose, as follows:

The white canvas shoes sold here are of English make. They are cheaper than American-made white shoes, but not so good. * * * The rubber soles, so far as I have seen, are red. Dealers say that white rubber soles are not in demand here, as they cost more. I have personally tested the low canvas shoes with red rubber soles sold locally, and compared them with several pairs of American low canvas shoes with white rubber soles that I brought from the United States. The American shoes cost me about 50 cents more a pair at retail in New York than the British-made shoes in Karachi, and lasted more than twice as long under identical conditions of wear. The American shoes were of better shape, and held their shape better.

The Karachi consulate would like to have American shoe catalogues and price lists to place on file.

AMERICAN RUBBER SHOES IN BULGARIA.

Bulgaria's trade with the United States has always been very fickle and subject to great variations. An example of this is shown by statistics of Bulgarian imports of rubber shoes from this country. In 1913 these imports amounted to 14,552 pairs of rubber-shoes, valued at \$8,757, whereas in

1914, according to the best available statistics, not a single pair of American rubber shoes was imported into that Balkan state.

FEDERAL TRADE COMMISSION INQUIRIES

A Federal trade commission has been appointed by Congress, to obtain information by correspondence and personal interview in regard to foreign trade conditions.

Public hearings have been given at various points throughout the country for the purpose of eliciting the desired information, and about 30,000 letters sent out, some 20,000 to American manufacturers and the remainder to others familiar with foreign trade conditions or interested in export commerce. The trade of the world has been so affected by the war in Europe that special opportunities have been opened for American enterprise to enter foreign markets and obtain a largely increased share of their trade.

The letters were accompanied by a return postal card intended to give the commission a broad "yes" or "no" referendum on the advisability of export combinations and to put its members in touch with those willing to furnish facts covering topics on which the commission desires information. It is expressly stipulated that any facts communicated as confidential will be so treated by the commission.

Prompt and frank response is being made by business men to the inquiries, and at last account nearly 10,000 replies had been received, many of the answers being particularly explicit in regard to the advantages and disadvantages of cooperation in foreign trade.

The commission is desirous of completing its investigation with all possible despatch so that the results of its labors may be an aid to Congress in determining what action may be required in the public interest, for the promotion of American trade. An early response to its questions will be appreciated.

NEW REGULATIONS GOVERNING EXPORT PROCEDURE.

The announcement that new United States regulations relative to export procedure will become effective January 1, 1916, has created such intense interest among manufacturers and shippers that the Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, D. C., has found it necessary to re-print the new order, with explanatory text. That pamphlet is just off the press and is being supplied free of charge to those interested, upon application to the above-mentioned office. All shipments for export to foreign countries, or to Alaska, Hawaii, and Porto Rico, will be affected by the new regulations.

STATEMENT OF THE INDIA RUBBER WORLD.

Statement of the ownership, management, circulation, etc., required by the Act of August 24, 1912, of THE INDIA RUBBER WORLD, published monthly at New York, N. Y., for October 1, 1915.

Editor, Henry C. Pearson, Tompkins Corners, Putnam county, New York.

Managing Editor, None.
Associate Editor, John P. Lyons, Hotel Aphorpe, Broadway and Ninety-fourth street, New York.

Business Manager, William M. Morse, 99 North Broadway, Tarrytown, N. Y.

Publishers, The India Rubber Publishing Co., 25 West Forty-fifth street, New York.

Owner, Henry C. Pearson, Tompkins Corners, Putnam county, New York.

Known bondholders, mortgages, and other security holders, holding 1 per cent. or more of total amount of bonds, mortgages, or other securities: None.

(Signed) WILLIAM M. MORSE, Business Manager.
Sworn to and subscribed before me this sixth day of October, 1915.

(Signed) FREDK. SPRINGER, Notary Public,
Westchester County.
[SEAL]
Certificate filed in New York County. New York County Clerk's No. 204. Register's No. 6370. (My commission expires March 30, 1916.)

THE HOME OF THE PENNSYLVANIA COMPANY.

ABOUT twenty-six miles from Pittsburgh, at Jeannette, in a picturesque valley adjacent to the main line of the Pennsylvania Railroad, are the factory and main offices of the Pennsylvania Rubber Company, a thoroughly modern establishment.

The company started as manufacturers of rubber goods of various descriptions in 1902. The growth of the business made reorganization necessary in 1910, when many new additions were made to the rapidly expanding plant. Last year, the building that forms the central feature of our picture, a six story, fireproof structure 200 x 140 feet, with steel frame, brick walls and concrete floors and columns, was completed, making an addition of 125,000 feet of floor space to the already large plant, which now has in the various buildings, a floor space of 400,000 square feet. Five of the stories are employed for manufacturing purposes, the general offices of the company occupying the sixth or top floor. With the aid of the latest improved machinery the company turns out daily 2,000 "vacuum cup" automobile tires, 5,000 automobile inner tubes, 3,000 bicycle tires and 3,500 hand-made tennis balls. A new power plant, adjacent to the main building, with boilers of 3,000 horse-power and turbo-generators, furnishes power, light and heat for the various departments.

A feature of the establishment is the solicitude displayed for the comfort and health of employees, which is regarded as a factor in successful work. Light and fresh air are abundant on every floor. For every employee a steel locker is provided and in addition to the excellent lavatory accommodations there are 14 shower baths for the use of employees. The drinking water supplied by never-failing sanitary fountains, is first filtered, sterilized and refrigerated. A dining room, a hospital with skilled attendance, and a laboratory contribute to the completeness of this model home of the "vacuum cup" tires.

BULLET-PROOF TIRES AGAIN.

Five years ago it was attempted to adapt the Casimir Zeglen invention of a bullet-proof fabric to the manufacture of pneumatic tires, but the Philadelphia company which acquired the rights was not successful in the undertaking and failed financially. The problem has been taken up again by a \$50,000 corporation, formed recently by Mr. Zeglen in South Bend, Indiana, and known as the Zeglen Tire & Fabric Co. Dr. E. R. Dean, of South Bend, is president of the new company, and F. J. Hardy, secretary.

OPIUM SMUGGLED IN RUBBER TIRES.

The daily newspapers recently reported a new use for rubber pneumatic tires which was discovered in Manila, Philippine Islands. A large touring car was landed on the wharf from a trans-Pacific liner and driven away under its own power. It was afterwards learned that \$27,500 worth of opium had been injected into the four tires fitted to the wheels of the car and into three spare tires carried "for emergencies."

CHANGES AT THE FISK RUBBER CO.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, has issued an addition to its first preferred stock of \$1,500,000, making the total outstanding stock, \$14,775,000.

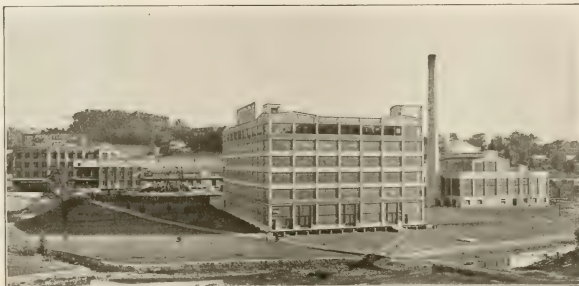
New additions to the plant, now in process of construction, are an administration building; a concrete warehouse, 300 x 120 feet; a manufacturing building, 600 x 120 feet; each building to be six stories high—which will give the company a total floor space of more than 27 acres.

The Fisk Company has appointed R. D. McPhal manager, covering the states of Oregon, Washington, Idaho and British Columbia, with headquarters at Portland, Oregon.

NEW RUBBER COMPANY AT PLAINFIELD.

The Rubber Insulated Metals Corporation, recently incorporated in New Jersey, has purchased the Electro-Chemical Rubber & Manufacturing Co. and now controls its patented electrochemical process for the permanent attachment of rubber to iron and steel. The

company has secured the plant at Plainfield, New Jersey, formerly operated by the Century Rubber Co., and is engaged in manufacturing the Century brand of automobile tires and inner tubes. The capacity of the equipment is 200 or more tires and tubes daily. The factory is in charge of J. A. MacEwan, superintendent, and



PLANT OF THE PENNSYLVANIA RUBBER CO., JEANNETTE, PENNSYLVANIA.

Dr. Leo Daft, chemist and consulting engineer. It is the plan of the company to add to its tire business a line of mechanical goods, especially such as require the attachment of rubber to metal, as in solid tires, squeeze rolls, valves and other specialties.

A RUBBER FIBER TIRE TREAD.

The main portion of the tire tread here illustrated consists of one continuous piece of specially compounded fiber, $\frac{1}{2}$ inch thick on the tread portion, and tapering down to where the tread enters the beads to approximately $\frac{1}{16}$ inch. The manufacturers claim that this tread affords unequal wearing and resilient properties, the side walls giving with the movement of the tire as leather side walls cannot do, and the fiber being tougher than leather, and very flexible and waterproof. The one-piece construction does away with the laps along the side that all leather treads must have, and which let in water. It can be cemented at the bead of the casing, and fitted perfectly to any sort of tire—after inflation to the correct pressure, depending upon the size of the tire—the edges gripping between the rim and the casing, and being held on by the same pressure and in the same manner as the tire itself. [V. K. Sturges Co., Oakland, California.]



News of the American Rubber Trade.

BOSTON WOVEN HOSE & RUBBER CO.

THE Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, has filed with the Secretary of State of Massachusetts a statement of its financial condition, as required by the statutes, for the business year ending August 31, 1915, the details of which are reproduced below:

ASSETS.		
Patents		\$1.00
Office furniture		1.00
Land assessed value	\$100,000.00	
Buildings	1,536,024.23	
	\$1,696,924.23	
Less reserve for depreciation	480,358.17	\$1,216,566.06
Machinery and tools	\$1,566,767.32	
Less reserve for depreciation	802,784.63	763,982.67
		\$1,980,650.73
Cash		\$334,033.08
Accounts receivable		56,024.52
Merchandise inventory		869,404.14
		\$3,745,182.19
LIABILITIES.		
Loans		
Accounts payable (not yet due)	\$49,366.20	
Accrued wages	11,034.52	
Unpaid dividend	380.00	\$60,770.72
Capital stock	\$2,000,000.00	
Surplus and undivided	1,684,411.47	\$3,684,411.47
		\$3,745,182.19

At a directors' meeting the regular quarterly dividend of 3 per cent. on common stock was declared and the regular semi-annual dividend of 3 per cent. on preferred stock, both dividends payable December 15 to stockholders of record December 6.

The company will increase the common stock from \$1,250,000 to \$2,000,000, distributing the new stock to present holders in the form of a 60 per cent. stock dividend.

A DECISION IN FAVOR OF THE MARKS' PATENT.

A recent decision by District Judge Harel of the United States Circuit Court of Appeals, of New York, declares that the A. H. Marks' patent on recovered rubber (the alkali patent) is valid.

RUBBER COMPANY DIVIDENDS.

At a meeting of the board of directors of The B. F. Goodrich Co. held October 27, a quarterly dividend of 1 1/4 per cent. was declared on Goodrich preferred, payable January 1, 1916, to stockholders of record December 21.

A quarterly dividend of 1 1/4 per cent. has been declared on Plymouth Rubber Co.'s preferred stock, payable December 1 to stockholders of record November 16.

RUBBER COMPANY SHARE QUOTATIONS

The following market quotations of the shares of rubber manufacturing companies on November 7 last are furnished by John Burnham & Co., 31 Nassau street, New York, and 41 South La Salle street, Chicago:

	Bid.	Asked.
Ajax-Grieb Rubber Co., common	375	450
Ajax-Grieb Rubber Co., preferred	101	110
Firestone Tire & Rubber Co., common	700	725
Firestone Tire & Rubber Co., preferred	112	121
Fisk Rubber Co., common	125 1/2	125
Fisk Rubber Co., 1st preferred	106 1/2	108 1/2
Fisk Rubber Co., 2nd preferred	123	123
The B. F. Goodrich Co., common	71	72
The B. F. Goodrich Co., preferred	111 1/2	113
Goodyear Tire & Rubber Co., common	338	342
Goodyear Tire & Rubber Co., preferred	111	112 1/2
Kelly-Springfield Tire Co., common	298	300
Kelly-Springfield Tire Co., 1st preferred, new	75	76
Kelly-Springfield Tire Co., 2nd preferred, new	65	66
Miller Rubber Co., common	109	111
Miller Rubber Co., preferred	109	111
Portage Rubber Co., common	65	75
Portage Rubber Co., preferred	98	100
Rubber Goods Manufacturing Co., preferred		
Swinhart Tire & Rubber Co.		90
United States Rubber Co., common	53 1/4	55
United States Rubber Co., preferred	107	108 1/2

*And accrued divs.

EARNINGS OF THE UNITED STATES RUBBER CO. LESS THAN IN 1914.

Owing to the increased cost of raw materials—which in the case of tires alone averages 10 per cent. higher than a year ago—the earnings of the United States Rubber Co. are not expected to be as large this year as in 1914, according to a statement recently made by Colonel Samuel P. Colt, president of the corporation. The company is now turning out, at its various plants, upwards of 8,000 automobile tires daily, and it is expected that the output will reach between 13,000 and 14,000 tires before very long.

The company's footwear business is holding its own.

Colonel Colt stated that a small quantity of rubber is coming in from the plantations owned and cultivated by the company in Sumatra. While the quantity coming in will increase from year to year, the plantations are not expected to furnish any considerable share of the rubber required by the company until 1921. If, as the colonel anticipates, this rubber, equal in quality to the grade now selling on the market at 60 cents, can be brought here at a cost of 25 cents per pound, the Sumatra plantations will be an asset of no small importance to the company.

NEW PRICES FOR AMERICAN PROCESS ZINC OXIDE.

The New Jersey Zinc Co., New York, recently announced to the trade that American process "Horsehead" zinc oxide will be sold under a semi-annual contract and the clauses relating to protection and cancellation will be omitted. Deliveries will be limited to a maximum of 20 per cent. monthly, and will be spread as nearly as possible over the period of contract in regular monthly quantities. Where more than one grade is used, a definite quantity of each is to be specified.

Sales of the "Florence" brand, French process zinc will be confined to the first quarter of the year 1916. Contracts will be written separately and such tonnage will not be included in making up the 50-ton base of other grades. Where more than one grade is used a definite quantity of each is to be specified.

The following prices are for contracts covering the periods above mentioned, deliveries to begin January 1. They are based on shipments in barrels, f. o. b. shipping point, with freight allowance on carload lots. When shipped in paper bags of 50 pounds net weight, in carload lots, the price will be one-eighth of a cent a pound less than that given for "Special" and "XX Red." Quotations are subject to change without notice.

AMERICAN PROCESS "HORSEHEAD" BRAND			
Special	50-Ton Base.	Carloads.	Less Carloads.
XX Red			
White			
White, Sulf.			
White, Sulf., Sulf.			
Red, Sulf.			

A SURREPTITIOUS SHIPMENT OF RUBBER ON THE ZEALANDIA

The protest entered by the captain of the American steamer *Zealandia* against the exercise by the British cruiser *Isis* of the right of visit and search, on the ground that his vessel was at anchor within the three-mile limit from the coast of Mexico, has resulted in some interesting disclosures. It appears that the British consul-general in New York learned that 500 tons of rubber had been purchased for consignment to Malmö, Sweden, to the order of the German government. That it had been shipped from New York to New Orleans, thence to Progresso, Mexico, where it was to be loaded on the *Zealandia*. In the meantime, the British government, informed of these facts, had sent orders to the captain of the *Isis* to search the *Zealandia*, and the rubber was found in the cargo of rosin, hides, etc., she had loaded for Malmö, Sweden.

PRESIDENT J. NEWTON GUNN.

COLONEL SAMUEL P. COLT has always possessed the rare faculty of selecting lieutenants specially fitted to assist him in the administration of the great corporation of which he is the head. Now, to the able trio, Messrs. Sawyer, Williams and Price, all "right hand men," he has added as a fourth the well-known production engineer, J. Newton Gunn.

Mr. Gunn was born in Springfield, Ohio, in 1867. His boyhood and youth were spent in that charming middle western city, and the beginnings of his education were in its excellent public schools. After graduation there, he took special courses in the sciences, mathematics and languages, under private tutors. His first essay at business was with the Library Bureau of Boston, where he developed the use of commercial card indexes and invented the tab system.

As lecturer on industrial organization at Harvard College he was the first to define the field of industrial and production engineering. Indeed, he was the creator not only of the name "production engineer," but of the profession itself.

In 1901 Mr. Gunn organized the firm of Gunn & Richards, production engineers and certified public accountants, which afterwards became a corporation, and as its president was brought in contact with many of the great industrial organizations of the United States and Canada. In 1895 he was so impressed with certain organization features abroad that he spent 12 months on the continent studying industrial conditions. On his return to the United States, his services were at once in demand. He surrounded himself with able assistants, capable of handling the ordinary problems of accounting and efficiency, but in later years arranged his own work so that he could devote his entire time to one corporation. To do this he sometimes stood in the background and planned, and at other times took over the management in person and staid with it until the business was placed upon a sound, systematic, producing basis. Such a case as this was his administration of the affairs of the great Studebaker Corporation. After the amalgamation of the Studebaker Brothers Manufacturing Co. and the Everitt-Metzger-Flanders Co., he became general manager for two years, and systematized the great business on an efficiency basis.

The fact that Mr. Gunn had so brilliantly proved the value, or rather the necessity, for the production engineer in modern industry, brought him first to the attention of the officials of the United States Rubber Co. Negotiations, begun early last summer, finally resulted in the election of Mr. Gunn to the presidency of the United States Tire Co., and also to the office of assistant to the president of the United States Rubber Co.

For both of these positions Mr. Gunn is singularly fitted. A tireless worker, he never shows signs of hurry, worry or irritation. His desk is always clear, and most of his work is "done the day before."

In spite of his busy life, Mr. Gunn has time for club and social affiliations. For years he was one of the directors of the Lotos Club, New York; he is a fellow of the American Association of Public Accountants, a member of innumerable clubs, such as the Engineers, Midday (New York), etc. His home in the winter is in New York, and in the summer at his country seat, Braemore, Litchfield, Connecticut.

Charles R. Keiser, formerly connected with The B. F. Goodrich, McGraw Tire & Rubber, and Gordon Rubber companies, has accepted the position of factory superintendent of the Double Fabric Tire & Rubber Co., at Auburn, Indiana.

PERSONAL MENTION.

Van H. Cartmell, president of the Kelly-Springfield Tire Co., returned on November 8 from an extended tour of the Pacific Coast, in the course of which he visited the Exposition and also every prominent agent of his company from San Diego to Vancouver.

J. T. Rose, formerly vice-president of the Atlanta Steel Co., Atlanta, Georgia, has recently been elected president of the Midgley Tire & Rubber Co., Lancaster, Ohio.

W. V. Logan has joined the McGraw Tire & Rubber Co., East Palestine, Ohio, as assistant sales manager. Mr. Logan has been identified for many years with the tire business, and recently returned from a trip to Russia on behalf of one of the large tire companies.

H. D. Palmer has been appointed New York State representative of the Knight Tire & Rubber Co., Canton, Ohio, succeeding E. J. Coniff, who has resigned.

M. S. Azulay, formerly a salesman for the Derby Rubber Co., Derby, Connecticut, and more recently manager of the Nearpara Rubber Co., Trenton, New Jersey, has been engaged by the Akron Tire Co., Inc., New York, to represent them in the Southern States.

E. S. Williams, president of the United States Tire Co., has resigned and will devote his exclusive attention to the mechanical rubber business of the United States Rubber Co. J. Newton Gunn, assistant to Colonel Samuel P. Colt, president of the United States Rubber Co., has been made head of the tire company.

Frank Waldo, of the firm of E. M. & F. Waldo, is on an extended business trip through the Middle West and Pacific Coast. Mr. Waldo is chairman of the membership committee of the National Paint, Oil & Varnish Association, and while at the Coast he worked for that committee, as well as attending to business matters for his firm, and also visited the San Francisco and San Diego expositions. He is now returning by way of Tacoma, Portland, Seattle, Minneapolis and Chicago, and expects to arrive in New York about Christmas-time.

Raymond G. Wells, who formerly specialized as an expert on electrical installation for the rubber trade for the Westinghouse Electric Co., has resigned his position and accepted one with the Alexander Hamilton Institute of New York. Mr. Wells' present effort is in the line of securing students for the reading course on business, which is now being used by ambitious young rubber men.

The retirement is announced of W. C. Hendrie, as manager of the W. C. Hendrie Rubber Co., Torrance, California. R. Ahrens is his successor. The retirement of W. F. Hackett, the company's superintendent, who is succeeded by E. W. Snyder, is also announced.

G. B. Withers, a pioneer planter of *Hevea* in British Guiana, who is located at "The Hills" Estate, Bartica, some forty miles up the Essequibo River, was a recent visitor to New York.

Charles A. Besam, formerly of the Knight Tire & Rubber Co., Canton, Ohio, has recently acquired control of the Quality Rubber Co., Hartsville, Ohio.

NEW TIRE LINER.

From Cleveland, Ohio, comes another addition to the innumerable inventions for prolonging the life of pneumatic tires. The new tire life-saver consists of a heavy rubber inner tire or liner encasing three resilient spring steel ribbons that protect the tread and side walls of the casing. The extra thickness of this liner tire is overcome by using smaller inner tubes and inflating at less than normal pressure. [National Pneumatic Safety Inner Tube Co., Cleveland, Ohio.]



J. NEWTON GUNN.

JOSEPH W. WORK.

It is a safe wager that a very large percentage of the rubber footwear men of the world would recognize the accompanying portrait as that of "Joe" Work. His familiarity with the industry, or at least one branch of it, footwear, has brought him in touch with practically every manufacturer in that line, and has thus broadened out his acquaintance to many in other branches of the rubber trade.

Joseph W. Work was born in Newburyport, Massachusetts, May 20, 1852. The family is of the old Presbyterian, North of Ireland type, the head of the family landing on the Isle of Shoals, off the New Hampshire coast, in the early colonial days, and later settling in Newburyport. His grandfather was town clerk there before it became a city, and was also sexton and clerk of the historical Old South Church. It was then



JOSEPH W. WORK.

his duty to call or "cry" the marriage banns on three successive Sundays before a marriage could be solemnized.

Mr. Work received his education in the schools of his native city, and then secured a minor position in the old Mechanics' Bank there. Later he went to the Maverick Bank in Boston, where for several years he held the position of cashier, which he retained until the institution closed in 1892. For six months thereafter he was associated with the receiver of the bank. Then, as he expresses it, he drifted into the last business.

Through the advice of E. A. Saunders, at that time prominent in the management of the United States Rubber Co., he formed the Middlesex Last Co., and purchased a last manufacturing plant. As manager of that concern he built up a most successful business, producing lasts for rubber and leather shoe manufacturers.

For years Mr. Work lived up to his name, and built up a fine business, which he controlled until this year, when, the opportunity presenting itself, he sold out to Taylor & Lander. But, even with the change of ownership, he still has charge of those customers who manufacture rubber footwear, though relinquishing the leather shoe end.

Mr. Work has acquired every degree in Masonry, and has filled nearly every chair in the various bodies. He is treasurer of six Masonic bodies, and also holds the same office in the Mystic Shrine. He was treasurer of the entertainment committee at the triennial meeting and election of officers of Northern Jurisdiction of the Supreme Council in Boston last September.

Mr. Work is past president of the Point Shirley Club, and as a member of the house committee has several times placed the clubhouse at the disposal of the New England Rubber Club and its successor, the Rubber Club of America, Inc., on the occasions of their summer outings. The banquets held there by the rubber fraternity have never been excelled by those at outings held elsewhere. At all of them Mr. Work has been in evidence as a courteous, genial host.

SON OF DR. WATTS IN NEW YORK

Charles T. Watts, son of Dr. Francis Watts, C.M.G., D. Sc., F.R.C., F.C.S., head of the Imperial Department of Agriculture for the West Indies, is now in New York. Mr. Watts has been connected with the various experiment stations in the West Indian Islands, notably at Dominica and Jamaica, and did much in experimental rubber planting.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS

A firm in Portugal desires samples and price lists of golden sulphide of antimony, pigments, etc. Report No. 18,866.

A business man in Norway wishes to communicate with American manufacturers or exporters of vulcanized (stranded) cable. Report No. 18,899.

An English firm desires quotations on cheap fountain pens. Report No. 18,934.

A New Zealand firm wishes to act as agent for the sale of chewing gum. Report No. 18,938.

A commission agent in Spain desires samples, catalogs, price lists, etc., of American rubber overshoes. Report No. 18,946.

An American consular officer in an insular possession states that there is a market in his district for automobile tires. Report No. 18,990.

A firm in South America, which has a ton or more of block balata to dispose of weekly, seeks buyers. Report No. 19,007.

A firm in India desires to be put in touch with American manufacturers of rubber stamp making materials. Report No. 19,014.

A Norwegian firm wishes to communicate with American dealers in suspenders, elastic for hats, and other articles. Report No. 19,015.

A Swiss firm wishes to represent an American manufacturer of garters. Report No. 19,033.

A business man in Holland would like to establish connections with manufacturers of elastic cord, rubber pharmaceutical goods, and wearing apparel. Report No. 19,077.

A representative of large plantations in the Dutch East Indies is in the market for machinery for preparing crude rubber for the market. Report No. 19,177.

A man in Spain desires catalogs, samples, prices and terms for combs made of ebonite. Report No. 19,249.

A Spanish company desires to communicate with manufacturers of automobile tires. Report No. 19,252.

A firm in Switzerland would like to establish commercial relations with American manufacturers of rubber balls used as toys. Report No. 19,253.

A firm in Italy desires to correspond with manufacturers of erasers and other stationery articles. Report No. 19,279.

A business man in Spain wishes to be placed in communication with manufacturers of corset materials and equipment, elastic webbing, rubber for garters, etc. Report No. 19,296.

RUBBER TRADE INQUIRIES.

[137.] An inquirer wants to buy toy balloons and toy balloon whistles.

[138.] A subscriber wishes to be put in touch with a maker of aprons used on compound mixing mills.

[139.] A dealer in rubber goods desires names of manufacturers of metal shut-offs for fountain syringes.

[140.] An inquiry has been received for the name of a manufacturer of tumbling barrels.

[141.] A correspondent desires the name and address of a manufacturer of vulcanized fiber in sheets and rods.

[142.] A buyer wishes to be put in touch with makers of India rubber rain overcoatings, in piece goods, not finished coats.

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

TRADE NEWS NOTES.

The Paint Grinders' Convention, held in Cleveland, Ohio, during the week ending November 13, was attended by a number of manufacturers and distributors of compounding ingredients used in rubber manufacture. Among them was R. W. Evans, of the Picher Lead Co., with factories at Joplin, Missouri, and offices in the Tacoma Building, Chicago, Illinois.

A 60 x 200 feet addition, of tile and concrete, is being built for the J. P. Devine Co., Buffalo, New York, manufacturers of vacuum drying apparatus.

A unique enterprise is being conducted by the Samson Co., Philadelphia, Pennsylvania. Rubber bands are made in special sizes and weights adapted for the particular uses stipulated by the customer. This business, less than a year old, has shown considerable progress and indicates the possibilities of even the humble rubber band.

The Electric Hose & Rubber Co., Wilmington, Delaware, which has been in a continuous state of expansion for the past ten years, is erecting a building 30 x 225 feet, to be used as a storehouse for raw material.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, has secured the services of Dr. W. H. Coon, of Haverhill Massachusetts, as medical inspector or in charge of the welfare work in their factories.

The Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio, is putting up an addition to its plant to accommodate two 10-ton cranes.

The Buffalo Foundry & Machine Co., Buffalo, New York, has opened a New York office at 1432 Whitehall Building, Battery Place, this city. The company manufactures the "Bufovak" apparatus, which includes vacuum dryer, of all types for drying all sorts of materials; dry vacuum pumps; condensers; vacuum drying and impregnating apparatus, etc. They also make complete plants and apparatus for the manufacture of aniline, phenol, beta-naphthol, picric acid, caustic soda, and acids. They do a general jobbing, foundry and machine business, and can quote on castings up to 200 tons weight each, including all necessary foundry and machine work.

The I. T. S. Rubber Co., Elyria, Ohio, is putting out a rubber heel, said to be designed by a practical shoemaker. It is claimed that this heel solves the problem of tight joints without cementing. It may be nailed on any leather heel regardless of shape, and the back pressure on the edge insures a tight joint.

The Clement Restein Co., Philadelphia, Pennsylvania, changed its name on September 28 to the Belmont Packing & Rubber Co., the personnel of the company remaining as before.

On October 12, patent No. 1,156,523 was granted to the Davol Rubber Co., Providence, Rhode Island, for the "Rest Easy," non-slip Bed Cushion, described on page 268 of the February, 1915, issue of THE INDIA RUBBER WORLD.

The St. Mungo Manufacturing Co. of America, makers of golf balls, now occupies new quarters at 121-123 Sylvan avenue, Newark, New Jersey.

The Quaker City Rubber Co., Philadelphia, Pennsylvania, has recently arranged to have the John O. Flautt Carriage Co., of Memphis, Tennessee, act as its representative in selling tires and rubber accessories in Memphis.

BUILDING AIRSHIPS AT NAUGATUCK.

The first of the proposed fleet of dirigibles for the United States is now under way and the important order for the balloon fabric has been awarded to the United States Rubber Co. The work of constructing the fabric, which requires much skill and care in manufacturing, the success of the airship depending largely on the strength and capacity of the envelope, is now in progress at the India Rubber Glove Manufacturing Co.'s plant at Naugatuck, Connecticut.

The airship is being built by the Connecticut Aircraft Co., New Haven, Connecticut, under the supervision of Captain T. S. Baldwin, who supervised the building of the first German dirigible, and also the only dirigible ever owned by the United States Army.

The enormous envelope will have a tremendous lifting capacity and a new and improved shape, which by test has been proved to offer a minimum wind resistance. The airship, when completed, will be shipped to Florida, where it will be tested.

MONATIQUOT RUBBER WORKS CO. CONSOLIDATE OFFICES.

The Boston offices of the Monatiquot Rubber Works Co. have been consolidated with the general offices of the company at South Braintree, Massachusetts. This move eliminates the duplication

of records which were necessary before and makes for better efficiency throughout. All of the company officials are now located at the factory office building, which has been altered and improved to take care of the additional offices.

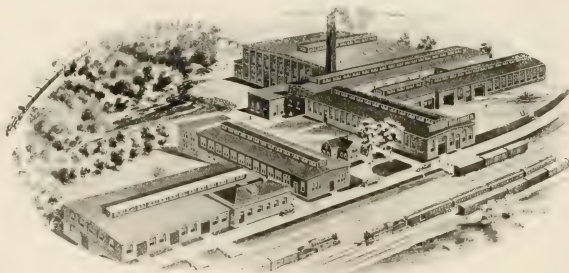
TWIN-CITY COMPANY ENLARGES.

The Twin-City Cord Tire Co., Inc., whose incorporation was mentioned in the November issue of THE INDIA RUBBER WORLD, has main offices in the Plymouth Building, Minneapolis, Minnesota, and branch sales offices in St. Paul and Duluth, Minnesota. We are advised that the company has decided to reorganize as a national company, with a probable capitalization of \$2,000,000. A site is being considered for a new plant in St. Paul, which covers about 30 acres and has, at the present time, suitable buildings on it with 100,000 square feet of ground floor space.

NO REASON TO FEAR A "DUMPING" OF FOREIGN GOLF BALLS.

A. G. Spalding & Bros., of New York, call attention to the expiration next April of the Haskell patent on golf balls, and confidently announce that they will be fully prepared to meet all competition, whether from manufacturers in this country or in England. Further, as they put it: "The Dimple marking is patented and we shall most assuredly protect our rights in it."

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."



MONATIQUOT RUBBER WORKS CO.'S PLANT AT SOUTH BRAINTREE, MASSACHUSETTS.

MR. BOURNE AND BY-PRODUCTS UTILIZATION.

Word comes from Chicago that Lyman M. Bourne is now associated with the By-Products Realization Co. as vice-president. Mr. Bourne has been active in the rubber industry ever since his graduation from the Massachusetts Institute of Technology in 1904.



LYMAN M. BOURNE.

His first position was as research assistant in the laboratory of the late Dr. Carl Otto Weber, where he remained until Dr. Weber's death. He then entered the employ of the Revere Rubber Co. in their Chelsea plant, as chief chemist, and remained in this work until called to Brooklyn, New York, as superintendent of the Eastern Reclaimed Rubber Co. In 1909, he went with the Goodyear Tire & Rubber Co., where he held the position of chief chemist and department manager. In 1914 he became general manager of the Double Fabric Tire Co. at Auburn, Indiana, but resigned that position to accept the vice-

presidency of the By-Products Realization Co., Chicago, Illinois.

Mr. Bourne's rubber experience is wide and his acquaintance with the trade is very large. His energy and efforts in his new connection will be applied, as he states it, in the prevention and utilization of by-products and waste material.

BRAZILIAN TARIFF ON TIRES.

Information received by the State Department, Washington, D. C., from the Hon. Edwin V. Morgan, American Ambassador at Rio de Janeiro, is to the effect that American interests are asking the Brazilian Government to fix the duty on automobile tires at 2 milreis per kilo [147 cent a pound] with a preferential reduction of 20 per cent. on tires manufactured in the United States. Ambassador Morgan is supporting this proposition, which, of course, would be of advantage to tire manufacturers in the United States. He also states that the provision of the law last year, known as the "Fine Para" law, will probably be reconsidered by the present session of the Brazilian Congress.

NEW INCORPORATIONS, WITH AUTHORIZED CAPITAL, ETC., 1915.

American Tire Company of West New York, New Jersey, October 29 (New Jersey), \$100,000. William Kahn, August Kahn, Otto Schumann, 577 Fifteenth street; John Berger, Alphonse Thourot, 522 Bergenline avenue, West New York, New Jersey. Office, 601-607 Fifteenth street, West New York, New Jersey. To manufacture rubber tires for automobiles, etc.

Blair Shoe Company, Inc., November 6 (New York), \$3,000. Max Darvas, 62 Smith street; Louis Blair, Jacob Blair, 214 Clinton street, Brooklyn, New York. Shoes and rubbers.

Emanuel Tietz and James Milaw, Inc., November 6 (New York), \$5,000. Jacob E. Schoenfeld, Esther Schoenfeld, Herman A. Schoenfeld, 605 West 115th street, New York City. Rubber drug sundries.

Eureka Tire Co., November 4 (New Jersey), \$50,000. Alexander Budson, Norman T. Rogers, Malcolm G. Buchanan, Trenton, New Jersey. Office, 26 West State street, Trenton, New Jersey. To manufacture and deal in tires, tubes, etc.

Lake Ruth Manufacturing Co., Inc., The, November 5 (New York), \$20,000. Dr. Joseph D. Denelsbech, Trenton, New Jersey; Charles Gedney, Mercerville, New Jersey; Charles Londoner, 258 Broadway, New York City. Rubber specialties.

Lyall & Co., Inc., W. H., November 22 (New York), \$50,000. Chester V. Lyall, Fidel Bigler, H. B. Vosburgh, Poughkeepsie, New York. Auto and tire business.

McNaull Tire Co., The, November 10 (Ohio), \$250,000. W. D. McNaull, M. W. McNaull, A. H. Emerson, A. C. Wanamaker, Gustav A. Strub. To manufacture tires and rubber goods, etc.

Mason Tire & Rubber Co., October 19 (Ohio), \$250,000. D. M. Mason, M. B. Mason, Robert G. Berlekemp, W. E. Sexton, O. M. Mason. Office, Cleveland, Ohio. To manufacture auto tires and rubber supplies. This corporation was listed by mistake in the November issue as the Marion Tire & Rubber Co.

New Castle Rubber Co., of New York, Inc., The, October 15 (New York), \$5,000. Richard S. Ireland (president), Alexander T. Coutts (secretary and treasurer), Ella P. Edelstein, 237 Fifth street; Max Rosenfeld, 890 Beck street; H. J. Kearns, 52 West 65th street, New York. Office, 1662 Broadway, New York City. To deal in the "New Castle" and "Lehigh" tires.

News Manufacturing Co., Inc., November 5 (New York), \$5,000. Joseph Oxenberg, 261 Broadway; Hyman Mates, 141 Stanton street; H. David Frackman, 148 West 111th street, New York City. Rubber and gum business.

Penn Rubber Co., William, November 4 (Pennsylvania), \$5,000. E. E. Gallup, Herbert Patterson, Wilkinsburg; Robert E. Bradburn, Pittsburgh, Pennsylvania. Office, Penn Station, Pennsylvania. To manufacture and deal in tires and tubing, etc.

Pittsburgh Tire & Accessories Co., November 9 (Delaware), \$10,000. J. J. McGeary, Berch and Hilf streets, Mt. Lebanon; J. F. McNaull, 822 N. Euclid avenue; G. E. Evans, 197 Watson McDonald, Pittsburgh, Pennsylvania. To deal in automobile tires, tubes and accessories.

Republic Tire Company of New Jersey, October 1 (New Jersey), \$125,000. James W. Pettit (president), 58 Amherst street, East Orange; Marcel R. Clodio (vice-president), 77 Bleeker street, Newark; Harold H. Wilcox (treasurer and secretary), 8 West Overroad, Montclair, New Jersey. To deal in automobile shoes and tubes.

Rubber Insulated Metals Corporation of New Jersey, November 13 (New Jersey), \$100,000. Charles P. L. Huston, 15 East 40th street; William E. Conley, 52 William street, New York City; J. Stuart Eakin, Englewood, New Jersey. Office, 902 North avenue, Plainfield, New Jersey. Its objects are the electrochemical and metallurgical preparation of surfaces, metallic and otherwise, for the chemical attachment of india rubber and its compounds, and the attachment of india rubber and its compounds to any and all such surfaces, etc.

Stowe Rubber Co., September 24 (California), \$20,000. William J. Stowe, Ada F. Stowe, Perry W. Stowe, Los Angeles, California. To deal in automobile supplies, rubber fabric, etc.

Tire Company of Rochester, Inc., November 4 (New York), \$10,000. Milton Gladstone, 1774 Madison avenue; Joseph J. Jacobs, 2010 Seventh avenue, New York City; William Reissfeld, 830 Fox street, Bronx, New York. Auto tires, supplies, etc.

United States Rainproof Manufacturing Co., Inc., November 11 (New York), \$10,000. Benjamin Katz, 27 East 10th street; Jacob Singer, 690 East 158th street; Morris Weshkoff, 986 St. Johns avenue, New York City. To manufacture raincoats, etc.

U. S. Wheel & Tire Co., September 15 (Illinois), \$300,000. E. S. Gleasman (president), S. D. Ross (secretary), Rockton, Illinois. Office, Bridge street, Rockton, Illinois. To manufacture and deal in automobile tires, etc.

TRADE NOTES.

The United States Tire Co., according to President Samuel P. Colt, is bringing out a new "non-skid" tire, to be known as "Union Tread," at a price not much higher than plain tread tires. With the well-known "Chain" and "Nobby Tread" types, the company's line of tires is now complete.

The newspapers have of late bristled with the news that some \$80,000 worth of pneumatic tires had been stolen to keep them from being shipped to the Allies and used on motor trucks, etc., in the war zone. They also claimed that some of these tires were once the property of The B. F. Goodrich Co. From that company, however, comes this disclaimer: "So far as we know none of our tires were included in this theft." The fact that the size of the tires said to have been stolen was indicated in metric measures, would arouse suspicion if they were offered for sale in the United States. Several arrests are reported to have been made in connection with the theft.

At a meeting of the stockholders held at Toledo on November 15, the corporate name of the Toledo-Ford Tire Co., Findlay, Ohio, was changed to the Toledo-Findlay Tire & Rubber Co. This course was necessary owing to the objection of the Ford Motor Co. to the use of the word "Ford" in the original name. It was also agreed that the word "Ford" on other than Ford sizes was not desirable.

The Akron Tire Co., Inc., New York, informs us that its appeal from a decision of Judge Sulzberger in the Court of Equity, Philadelphia, Pennsylvania, enjoining the company, on application of the Akron Tire Co., Philadelphia, from using that title when doing business in Pennsylvania, as recorded in the September issue of THE INDIA RUBBER WORLD, has been sustained. The New York Company was able to furnish indisputable evidence of the transaction of a large amount of business in Pennsylvania for several years and the expenditure of considerable sums for advertising and other propaganda.

The Gordon Tire & Rubber Co., Canton, Ohio, has recently opened a branch in New York at 1737 Broadway, of which W. A. Young is manager.

The A. L. A. Tire Co. is reported to be erecting a 275 x 100 foot factory building in Flint, Michigan, where they contemplate starting manufacturing operations with a capacity of 200 tires daily. The company is capitalized at \$500,000.

The Marion Tire & Rubber Co., Marion, Ohio, whose incorporation was mentioned in the October issue, has elected the following officers: W. W. Holverstott, president; Charles W. Fairbanks, vice-president; D. H. Lincoln, treasurer, and Wilbur Jacoby, secretary.

A convention of Firestone salesmen and representatives of Des Moines, Iowa, was recently held in that city to discuss trade matters. President H. S. Firestone, the speaker of the evening, stated a few reassuring facts in regard to the available supply of crude rubber. Other prominent members of the Akron organization who attended the convention were R. J. Firestone, sales manager; Edward Babcox, advertising manager; F. C. Blanchard, Henry Wallace, Henry Ingham and C. C. Carlton.

Trustees in Bankruptcy of the New York Commercial Co. have sent out a circular letter announcing that 627 shares of the 7 per cent., cumulative preferred stock of the Seamless Rubber Co., New Haven, Connecticut, are included in the assets of the bankrupt concern and asking for bids on all or any part of the shares. The bids (sealed) will be received up to 2 p. m., December 20, 1915, at the office of Hon. J. Townsend, Referee in Bankruptcy, at 45 Cedar street, New York, and must be accompanied by 10 per cent. of the amount in cash, or certified check.

The Victor Rubber Co., Springfield, Ohio, has increased its capital stock from \$150,000 to \$300,000 to finance its rapidly

growing business. During the past year this company has added a complete line of pneumatic tires, tubes and motor truck tires. The plant is operating night and day, and enlargements are being considered which will more than double the present capacity.

American Rubber Co., Chicago, Illinois, has increased its capital stock from \$10,000 to \$15,000.

After January 1, 1916, the Mishawaka Woolen Manufacturing Co., Mishawaka, Indiana, will manufacture a full line of rubber boots and shoes, including light weight shoes not heretofore made by the company. For this purpose a building 400 x 100 feet and four stories high has been erected.

The estate of the late Isaac B. Kleiwert, of the I. B. Kleiwert Rubber Co., whose obituary appeared on page 421 of the May, 1913, issue of THE INDIA RUBBER WORLD, has recently been appraised at \$1,811,209. Mr. Kleiwert gave \$174,736 to his widow and, in a codicil, \$75,000 in Kleiwert bonds. His daughters, Belle Sessler and Hermine Kleiwert, each received \$296,099, and to Henrietta K. Guinzberg and Leonie K. Guinzberg he left \$266,805 each.

The Republic Rubber Co., Youngstown, Ohio, has taken a lease on a 4-story building to be erected at 806 North Broad street, Philadelphia, Pennsylvania. The new building will contain over 10,000 square feet of floor space—more than five times that of its present Philadelphia premises—and will be completed about January 1.

The Racine Rubber Co., Racine, Wisconsin, has begun a \$75,000 three-story addition, 52 x 77 feet, to be used as a mill room and crude rubber storage. It will be finished February 1.

It is the intention of the Converse Rubber Shoe Co., Malden, Massachusetts, early in 1916, to increase the capacity of its mill from 8,000 to 15,000 pairs of shoes a day, in order to keep pace with the demand for its goods.

A NEW OHIO TIRE FACTORY.

The Mason Tire & Rubber Co., Cleveland, Ohio, recently incorporated, has offices at 1836 Euclid avenue, pending the selection of a location for the plant, which will be in the Cleveland-Akron district. The company plans to erect a building containing 30,000 square feet, to be finished in four months, and it is hoped that the factory will be in operation by April 1. A full line of strictly handmade tires and tubes of a 4,500-mile quality will be manufactured. The officers of the company are: O. M. Mason, president; W. E. Sexton, vice-president; M. B. Mason, treasurer; I. R. Davies, secretary; D. M. Mason, general manager. B. E. Frantz, a practical tire man, is superintendent.

NON-EXPLOSIVE NAPHTHA BENCH CAN.

A new "safety first" appliance is the McNutt floating valve naphtha bench can.

A floating valve rests on the naphtha or gasoline, as the case may be, and permits the operator to use either a light brush, a sponge, or a cloth where a small quantity is desired. The pressure upon the float automatically forces the naphtha up through a fine screen to the brush or sponge, the excess flowing back in the same manner when the pressure is released.

A lighted match may be dropped into the can and the vapor will burn slowly. It is immediately extinguished, however, by closing the top. There is absolutely no danger of an explosion, for the evaporation is but slight even when the top is open. [United Shoe Machinery Co., Boston, Massachusetts.]



THE RUBBER CLUB OF AMERICA, INC.

UNDER date of November 1, 1915, a circular letter was sent out by the Rubber Club addressed particularly to export departments, and calling renewed attention to the importance of a strict observance of the seventh paragraph of the guarantee, which reads as follows:

If we export any manufactured or partly manufactured goods to a destination outside of Europe, not being a British possession, we will, prior to or simultaneously with the shipment, give you particulars of the goods so shipped and their destination.

The fact that the Rubber Club had prepared and was supplying to rubber manufacturers a form of notification to the British consul of such shipments, is also referred to.

The circular then goes on to state that a number of firms are selling rubber goods to export houses in New York, without notifying the British consul of the fact, such goods finding their way to non-European countries other than British possessions.

To prevent this, which would practically amount to an evasion of the guarantee, it is pointed out that American manufacturers should report such sales to the British consul on the form provided, giving the name of the concern to whom the goods were shipped.

The fact that the continuation of the present arrangement with Great Britain depends on compliance with the spirit of the agreement is emphasized in the circular, which closes with a renewal of the offer to supply copies of the notification form.

In another letter, dated November 11, the Rubber Club informs rubber manufacturers of a ruling by the British Government, dated October 26, 1915, to the effect that samples of rubber goods having no real commercial value should be forwarded to neutral European countries by way of the United Kingdom, no license for sending such samples from the United Kingdom to the country of their final destination being necessary.

It is stated in the communication from the British Government, that if it can be shown that existing conditions impose any real hardships on those engaged in legitimate trade, the government will consider any arguments on the subject.

MECHANICAL RUBBER GOODS MANUFACTURERS' MEETING.

The annual meeting and dinner of the Mechanical Rubber Goods Manufacturers' Division of The Rubber Club of America, Inc., was held November 3, 1915, at the Union League Club, New York.

The meeting was a social and business success and many important matters were discussed by the members in session. The guest of the evening was W. F. Bowers, of the Bowers Rubber Works, San Francisco, California. Those present were President William T. Cole, Fabric Fire Hose Co., New York; Vice-President John J. Voorhees, Voorhees Rubber Manufacturing Co., Jersey City, New Jersey; George E. Hall, Boston Woven Hose & Rubber Co., Cambridgeport, Massachusetts; Howard E. Raymond, The B. F. Goodrich Co., New York; J. S. Broughton, United & Globe Rubber Manufacturing Cos., Trenton, New Jersey; Henry Spadone, Gutta Percha & Rubber Manufacturing Co., New York; A. Boyd Cornell, Empire Rubber & Tire Co., Trenton, New Jersey; A. H. Elder, Boston Belting Co., Boston, Massachusetts; J. A. Lambert, Acme Rubber Manufacturing Co., Trenton, New Jersey; C. D. Garretson, Electric Hose & Rubber Co., Wilmington, Delaware; Charles E. Stokes, Home Rubber Co., Trenton, New Jersey; Edgar H. Wilson, Hamilton Rubber Manufacturing Co., Trenton, New Jersey; John J. Voorhees, Jr., and F. D. Voorhees, Voorhees Rubber Manufacturing Co., Jersey City, New Jersey; George A. Wies, Eureka Fire Hose Man-

ufacturers, Trenton, New Jersey; C. Heitzman, Jr., and H. E. Smith, Peerless Rubber Manufacturing Co., New York; J. H. Cobb, New York Belting & Packing Co., New York; W. F. Bowers, Bowers Rubber Works, San Francisco, California; J. T. Moore, Quaker City Rubber Co., Philadelphia, Pennsylvania; Charles Hardin, Republic Rubber Co., Youngstown, Ohio; Henry F. Hering, New York Rubber Co., New York; Harry S. Vorhis, secretary of the Rubber Club of America, Inc.

MEETING OF EXECUTIVE COMMITTEE, RUBBER SUNDRIES DIVISION.

A meeting of the executive committee of the Rubber Sundries Manufacturers' Division of The Rubber Club of America, Inc., was held November 4, 1915. The members present were Chairman Russell Parker, Parker, Stearns & Co., Brooklyn, New York; Charles J. Davol, Davol Rubber Co., Providence, Rhode Island; George B. Hodgman, Hodgman Rubber Co., New York City; Frederick H. Jones, Tyler Rubber Co., Andover, Massachusetts; Edward E. Huber, Eberhard Faber, Brooklyn, New York.

ANNUAL MEETING OF THE RUBBER TRADE ASSOCIATION OF NEW YORK.

THE annual meeting of the Rubber Trade Association of New York was held at 82 Beaver street, New York, on Thursday, November 11, 1915, at 3 p. m. President W. E. Bruyn called the meeting to order, and Secretary E. Weber read the minutes of the last meeting. A board of directors was elected to serve during the year, consisting of William T. Baird, W. G. Ryckman and William E. Bruyn. The following amendments to the constitution and by-laws, providing for both active and associate memberships, dues and fees, were adopted:

ARTICLE I.

MEMBERSHIP.

SECTION I. Membership shall consist of active and associate members.

SECTION II. Any co-partnership, corporation or individual engaged in the business of crude rubber shall be eligible to active membership.

SECTION III. Any co-partnership, corporation or individual connected with the rubber industry shall be eligible to associate membership.

SECTION IV. Every member of the association shall conform to and be bound by the regulations and rules of the association for the time being in force, and shall on becoming such member sign these regulations and, on signature of the same, shall be deemed to have entered into a covenant and contract to that effect with each and every other member for the time being of the association, and with all firms, corporations or individuals becoming members thereafter.

SECTION V. Any co-partnership or corporation shall designate the member or officer who shall represent it in the association. Such member shall have the right to appoint another member of the co-partnership or corporation as his substitute, if not able to be present. Each individual co-partnership or corporation holding an active membership shall be entitled to one vote in the association.

ARTICLE IV.

MEMBERSHIP DUES AND FEES.

SECTION I. Initiation fee for active membership to the Association shall be \$25.00.

Subdivision (a) The annual dues for active membership shall be \$50.00.

Subdivision (b) The annual dues for associate membership shall be \$25.00.

SECTION II. The annual dues shall be payable in advance on the first day of November.

SECTION III. All new members, immediately upon election, shall pay to the association the annual dues for the then current year.

SECTION IV. The initiation fee of active members shall be paid to the Treasurer within ten days after written notice has been

given a member-elect of his election, and in default of payment thereof, he shall be deemed to have declined membership.

Section V. Members failing to pay their annual dues within 30 days may be subject to suspension from the privileges of the association in the discretion of the Membership Committee.

The question of classifying and standardizing the various grades of crude rubber, and the necessity of a well-defined nomenclature that will be approved and recognized by the rubber trade, was fully discussed. A committee will be appointed at the next directors' meeting to further the project.

The following were present:

W. E. Bruyn, chairman, L. Littlejohn & Co.; Robert B. Baird, Rubber Trading Co.; F. Mullen, United Malaysian Rubber Co.; A. B. Beers, A. B. Beers; H. A. Gould, Gould Commercial Co.; E. Maurer, E. Maurer Co., Inc.; F. H. Peaty, F. H. Peaty; W. G. Ryckman, W. G. Ryckman; W. H. Stiles, W. H. Stiles; Karl Schroder, Karl Schroder; L. M. Byles, L. M. Byles; George E. Pett, Pett & Dumont; A. V. W. Tallman, A. V. W. Tallman; George Muller, Muller, Schall Co.; A. B. MacNamara, A. B. MacNamara Co., Inc.; F. G. Gove, Gove & French; F. R. Henderson, Henderson & Korn; C. T. Wilson, C. T. Wilson Co., Inc.; M. Calvet, Pablo, Calvet & Co.; R. L. Chipman, R. L. Chipman; H. De Lanie, Robinson & Co.; L. P. MacMichael, L. P. MacMichael; H. S. Hammesfahr, W. Hammesfahr & Co.; R. W. Earle, Earle Bros.; W. Weber, Rubber & Guayule Agency, Inc.

THE ASSOCIATED MANUFACTURERS OF ELECTRICAL SUPPLIES.

RECOGNIZING the necessity of active coöperation throughout the electrical manufacturers' industry, the manufacturers of electrical supplies appointed a committee to report on a plan for the organization, and, by its adoption, the Associated Manufacturers of Electrical Supplies was formally organized.

The objects of the organization, as stated in its constitution, are "to advance and protect the interests of the manufacturers of electrical supplies and of the materials entering into electrical construction, in manufacturing, engineering, safety and other problems, to promote the standardization of electrical material, to collect and disseminate information and to promote coöperation among the members."

Following the adoption of the plan of organization and constitution and by-laws submitted by the committee, the following officers were chosen:

President—R. K. Sheppard, Simplex Wire & Cable Co., Boston, Massachusetts.

Vice-President—H. B. Crouse, Crouse, Hinds & Co., Syracuse, New York.

Treasurer—J. W. Perry, H. W. Johns-Manville Co., New York.

General Secretary—Charles E. Dustin, 62 Cedar street, New York.

GOVERNORS.

A. W. Berresford, Cutler-Hammer Manufacturing Co., Milwaukee, Wisconsin.

Charles L. Blizard, Electric Storage Battery Co., Philadelphia, Pennsylvania.

Le Roy Clark, Safety Insulated Wire & Cable Co., New York.

H. B. Crouse, Crouse-Hinds Co., Syracuse, New York.

D. C. Durland, Sprague Electric Works, General Electric Co., New York.

J. J. Gibson, Westinghouse Electric & Manufacturing Co., Pittsburgh, Pennsylvania.

H. R. Holmes, R. Thomas & Sons Co., East Liverpool, Ohio.

J. F. Kerlin, National Carbon Co., Cleveland, Ohio.

J. W. Perry, H. W. Johns-Manville Co., New York.

W. C. Robinson, National Metal Moulding Co., Pittsburgh, Pennsylvania.

Walter Robbins, Wagner Electrical Manufacturing Co., St. Louis, Missouri.

B. E. Salisbury, Pass & Seymour, Inc., Solvay, New York.

R. K. Sheppard, Simplex Wire & Cable Co., Boston, Massachusetts.

Thomas M. Debevoise, Counsel, New York.

In the short time of its existence the association has formed

three sections that are in active operation, with officers and committees as follows:

THE INTERIOR CONDUIT SECTION.

Chairman—F. C. Hodgkinson, Safety Armored Conduit Co.
Treasurer—D. H. Murphy, American Conduit & Manufacturing Co.

Secretary—Alexander Laughlin, Jr., Central Tube Co.
Executive Committee—F. C. Hodgkinson, chairman; D. H. Murphy, Alexander Laughlin, Jr., C. E. Corrigan, Russell Dart, Oscar Hoppe, J. H. Trumbull.

SUB COMMITTEES.

Rigid Conduit Committee.
Non-Metallic Flexible Conduit Committee.
Metallic Flexible Conduit Committee.
Metal Molding Committee.

THE WIRE AND CABLE SECTION.

Chairman—W. A. Connor, Standard Underground Cable Co.
Secretary—W. S. Clark, General Electric Co.
Treasurer—Edward Sawyer, Atlantic Insulated Wire and Cable Co.

Executive Committee—W. A. Connor, chairman; F. J. Newburg, W. F. Field, Everett Morss, R. E. Lucas.

SUB COMMITTEES.

Industrial Conference Committee (to act with underwriters).
Committee on Special Specifications and Enquiries other than those of the Industrial Conference Committee.

The Rubber Covered Wire Engineers' Association, which has been 17 years in existence and has been active in the work of standardization, in coöperation with the Underwriters' Laboratories, has voted to transfer its activities to the Wire and Cable Section of the association.

Plans are being laid for five or more other sections, of which due notice will be given.

The Board of Governors will hold its next meeting on December 2, 1915, at 8 p. m., at the Hotel Biltmore, New York.

WIZARDS IN A GROUP.

Thomas A. Edison, the world's foremost inventive genius, Henry Ford, who builds automobiles for all the world, and Harvey S. Firestone, president of the Firestone Tire Co., Akron, Ohio—friends of long standing, who had been "doing" the San



A GROUP OF MODERN WIZARDS.

Francisco and San Diego fairs in company—met Luther Burbank, who does wonderful things with plants and fruits, at San Francisco, and were entertained by him at his experimental farm at Santa Rosa. The illustration of the group of "wizards" shows, left to right: Henry Ford, Thomas A. Edison, Luther Burbank, H. S. Firestone.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent

THERE is little let-up in the various lines of rubber goods production. All are busy; none below normal for this time of year and some finding more demand than capacity to supply. Among those in this latter condition the clothing trade is perhaps at the head of the list. The manufacturers of rubber coats and similar goods are so far behind their orders that they are rushing their working forces on overtime work as far as possible consistent with proper quality of the output. The makers of high-class coats are particularly busy. The makers of rubber footwear are busy on all lines, the only exception seeming to be in low felt overshoes, which have been growing in smaller demand for the last three or four seasons. This is more than balanced by an increased call for high arctics of the "emperor" variety. Tennis shoes are to be seen in all colors, plain and in combination, and with heels of all heights, even up to covered wooden heels with rubber "toplifts." There is a genuine boom in rubber soles—straight rubber and various composites and combinations—and rubber heels are in increasing demand. The hose business is quiet. There was less demand than usual for garden hose, and dealers have carried over pretty full stocks. Fire hose business is not heavy, but one or two makers of heavy vacuum hose have filled contracts. There is some increased call for rubber belting. Makers of molded goods and drug sundries are busy.

A new rubber factory is to be erected in Malden. The ground has already been broken preparatory to building. H. H. Kelley & Co., dealers in shoe findings and shoe store supplies of Boston, have taken title to several plots of ground at Maplewood station in Malden, which will be transferred to a new corporation about to be formed, under the name of the Malden Rubber Co. The new factory will be a two-story building, 125 x 40 feet, and is so planned that it can be added to and extended as the demand for their goods may warrant. L. H. Williams, who knows rubber manufacturing from one end to the other, both in Europe and here, will be the president of the new company and have charge of the manufacture of the product, which will be mechanical rubber goods and rubber soles and heels. Franklin P. Gowing, of the firm of H. H. Kelley & Co., will be the treasurer of the company. It is expected that the factory will be completed and in operation in January next.

The question of the legality of a franchise tax is to be tested by the bringing of a bill in equity in the United States Court, seeking to restrain the Tax Commissioner, the State Treasurer and the Attorney-General from collecting a franchise tax of \$40.161.59 from the Boston Rubber Shoe Co., of Malden, Massachusetts. This bill alleges that the company, in 1914, paid a tax of \$5,036.41, and that in March of the present year it received notice of an additional tax of \$40,161.99, purporting to be a franchise tax. This, the company contends is illegal and unconstitutional. The rate of the franchise tax for 1915 is \$18.55 per thousand dollars. This would make the assessed value of the stock of the Boston Rubber Shoe Co. about \$2,112,000.

Speaking of taxes, it may be of passing interest to the many readers of THE INDIA RUBBER WORLD who knew Robert Dawson Evans, to learn that Mrs. Marie A. Evans, his widow, pays the largest individual tax in Beverly, Massachusetts, her bill this year being \$83,589.92.

Mrs. Evans has made excellent use of her money in the way of public benefactions; the Evans Memorial Building being her gift to the Massachusetts Homeopathic Hospital, where are given weekly, during the winter, free public health lectures. In this beautiful building are housed the departments of clinical research and of preventive medicine. Another and finer gift, which

has been pictured in this journal, is the Evans addition to the Museum of Fine Arts in this city—one of the noblest pieces of architecture to be found in New England. But this is not all. Last month the trustees of the Museum of Fine Arts announced a further gift of \$50,000 from Mrs. Evans, to establish a memorial fund to the memory of her mother, Mrs. David Hunt. As Mrs. Hunt was interested in sculpture, Mrs. Evans has chosen that this fund shall be for the benefit of sculpture and modeling in the school of the museum. Part of the income of this fund is to be used for scholarships, to be awarded each year to promising students in sculpture. There will be two scholarships of \$250 each, these awarded yearly, and a traveling scholarship of \$1,200, awarded not oftener than once in three years, for a year of study in Europe by some gifted graduate of the school. The balance of the income is to be used toward paying the salary of the instructor in modeling.

The George P. Cox Last Co., of Malden, has been somewhat unfortunate of late. On October 1, one of its drying houses was burned. On November 17, another dry house met the same fate. Both were well filled with last blocks in the rough, which were being seasoned before being turned into lasts. The second fire destroyed 15,000 blocks, and the first nearly as many. Notwithstanding this loss, the manager of the plant states that there will be no interruption of the business, which will be carried on as usual, supplying lasts to the manufacturers of rubber boots and shoes. There were ten such dry houses on the premises, and thus it will be seen that while the loss was considerable, the company was but little inconvenienced by this double conflagration.

The Bemis Rubber Co.'s plant, situated on the Boston & Maine Railroad at Bemis, a section of Watertown, Massachusetts, has been sold to Everett C. Tarr of this city, and H. R. Berry of New York. From other sources it is reported that extensive alterations and improvements will be made, and that it will be occupied by the Pan-American Chiclé Co.

The plant occupies a lot of over 80,000 square feet of area, with buildings covering 20,000 feet, all equipped with boilers, engines and rubber working machinery. There is a railroad siding along the premises, to accommodate six cars. The location is a desirable one, and the plant, with the improvements contemplated, will have a large capacity.

The Avon Sole Co., of Avon, Massachusetts, began, not so long ago, manufacturing a sole compounded of rubber and shredded leather. After the sole was just right it was exploited among the shoe manufacturing trade. The prices were high, higher than some others tending towards a similar combination; but having proved that they were worth the prices, the company held to them, and kept up the quality, consistently refusing to cheapen their product. The consequence is that they have had to double their capacity to supply the demand, and the new addition to their plant is just completed, a new power house being also added to furnish heat, light and power.

The J. H. Stedman Co., the well-known scrap rubber house, announces the removal of its Boston office to South Braintree, Massachusetts, where it will be joined with the general office in the commodious new quarters recently erected. In the future all buying and selling inquiries should be addressed to the South Braintree address.

Harry M. Gordon, who for 19 years has been identified with the White Co., even before it made motor cars, was tendered a testimonial dinner by his past and his future business associates at the Engineers' Club on the evening of November 13. Mr. Gordon was with The White Co. in the old bicycle days, when he traveled and established agencies all over New England, and managed

the total store of that company in this city. When the company, following the trend of the times, began manufacturing automobiles, he did his share in the sales department, until 1905, when he became purchasing agent for the company.

On November 15 he assumed the management of the sales department of the Kelly-Springfield Tire Co. in this city. His many friends predict for him an assured success in his new position.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent

FIRE of mysterious origin swept through one of the great wire rope shops of the John A. Roebling's Sons' Co., November 15, resulting in a loss of about one million dollars. In addition to the damage sustained by the company, 29 houses in the vicinity of the shop were badly damaged. It is said that a large order of wire for one of the big tire companies was destroyed.

Rumors were rife that the blaze had been started by German agents on the supposition that material for the allied armies was in process of manufacture. The company denies that any war

benefit to the company, as it served to clear up, to the satisfaction of the men, many of the imaginary ills under which they had been convinced by outside labor agitators that they were working. Among other things, it was charged that the plant was unsanitary. An inspector from the State Department of Labor, on invitation of the factory officials, visited the plant, and after an extended inspection declared that conditions were highly satisfactory in every respect.

The Essex company report an extraordinary increase in the sale of rubber quots during the past six months.

Several of the rubber manufacturers who maintain their own machine shops have been affected by a strike of the Machinists' Union, which is demanding an eight-hour day. The men are still out at some of the places, including the shops devoted exclusively to the making of rubber machinery. It is thought, however, that in a majority of cases a compromise will be speedily arrived at. The Mercer Automobile Co. and The United & Globe Rubber Manufacturing Cos. reached an agreement with their men, who promptly returned to their places.

The John E. Thropp's Sons' Co., manufacturer of presses, tire-making machinery, etc., has had plans drawn for an addition to complete its new machine shop, which will then be 65 x 325 feet, with a gallery on one side 23 feet wide. It is completing a power plant which will be equipped with two 300-hp. boilers, a 450-hp. engine, with a 250-kw. generator, steam pumps and one 750-foot air compressor, all of which have been contracted for.

The Royal Rubber Works, which has been operating in a small frame structure, is erecting a new brick and steel plant 50 x 150 feet, to take care of increased orders. About seventy-five people will be employed when the new plant opens. This concern manufactures druggists' sundries. In its new plant a specialty will be made of a particular type of ice bag. S. Reinhart, head of the company, told THE INDIA RUBBER WORLD correspondent that he visited several other cities before deciding where to erect the new plant and came to the conclusion that no other locality offered anywhere near the advantages of Trenton for the production of rubber goods.

The Lakeside Rubber Co., Messrs. McCue & Pierce, are building a larger boiler room and installing a boiler and engine of increased capacity.

A new addition is being erected at the plant of the Joseph Stokes Rubber Co., to help take care of their increased orders for hard rubber goods. The addition, as planned, will be 75 x 90 feet and two stories high. When it is completed the firm will give employment to about 100 additional hands.

The Lambertville Rubber Co. has about completed the erection of an addition to the factory costing several thousands of dollars. The product of this company appears to be steadily increasing in popularity and the outlook for the coming year is bright.

Charles L. Huston, of New York, has bought at receiver's sale the automobile tire manufacturing plant at Plainfield, of Leon Jaffress, bankrupt, for \$23,300, in addition to a mortgage for \$15,000.

The Ogren car, driven by Tom Alley in the 350-mile Astor Cup race, which finished fourth, was fully equipped with the Thermoid Rubber Co.'s Nassau tires. Not only did these tires require no change during the race, but at the finish they were in almost perfect condition—"good for another race," as Mr. Alley stated it.



PART OF THE PLANT OF JOHN A. ROEBLING'S SONS' CO., DESTROYED BY FIRE.

material was being turned out in the plant, and scouts the idea that a spy started the fire. They are, nevertheless, unable to account for the start of the conflagration.

The insulated wire department of the Roebling's, which was destroyed by a mysterious blaze some months ago, is about ready to begin operations in a building erected on the site of the old structure; and it is pointed out as significant that the second fire should have occurred just at this time. It was commonly reported that war supplies were being made in the insulated wire department at the time it was destroyed. The work of rebuilding the wire rope shop on the site of the old structure will be begun without delay.

The labor trouble which for a time threatened to tie up the plant of the Essex Rubber Co. has been adjusted and most of the old operatives are back at work. A United States commissioner visited Trenton and talked the matter over with the strikers, who then decided that the offers made to them by the Essex company two weeks before the strike was declared were perfectly satisfactory. At the time of the settlement of the trouble the company agreed to take back the old employees as rapidly as possible. Announcement was made, however, that none of the men who went to work in the places of the strikers would be dismissed to make room for the old employees. The strike is said to have actually

Trenton's rubber industry was well represented at the recent annual convention of the Atlantic Deeper Waterways League, held in Savannah, Georgia. An exhibition of Trenton-made goods was held in the parlors of one of the hotels of Savannah. The display attracted much attention. While it was not intended that any trading should be done, a number of orders were actually booked. Included among the firms which maintained displays were: United & Globe Rubber Mfg. Cos., Woven Steel Hose & Rubber Co., Ajax-Grieb Rubber Co., Joseph Stokes Rubber Co., Empire Rubber & Tire Co., Acme Rubber Manufacturing Co., Thermoid Rubber Co., DeLion Rubber Co., Mecca Tire Co., Semple Rubber Co., L. M. Anderson Raincoat Co., and John A. Roebbling's Sons' Co. It seemed a revelation to the people of Savannah to learn that so many products were made in the New Jersey capital, and considerable Southern trade may be influenced as a result. Secretary Salter, of the Trenton chamber of commerce, presided at the display, which was under the direction of Mayor Donnelly.

Among the delegates named by Mayor Donnelly to represent Trenton at this convention were: George F. Eberhard, Empire Rubber & Tire Co.; C. H. Oakley, Essex Rubber Co., and representatives from the Hamilton Rubber Manufacturing Co. and the John E. Thropp's Sons' Co.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THERE is continued and consistent activity in the rubber industry throughout the State, every line being unusually busy, and with little prospect for any slack period during the next six months, at least. Orders are reported as being plentiful and the majority of available workers are employed in one or another of the different plants. In fact, the number of calls in the daily newspapers for persons to learn the work in the various branches have become noticeable by their frequency. Some of the concerns are said to be at the limit of their present facilities and have been forced to refuse additional orders. In this connection the concerns are delaying the erection of additional buildings until the present status and future conditions of business indicate exactly what may be expected.

* * *

It is reported that at the Narragansett Rubber Co., Bristol, where 450 hands are engaged in making rubber shoes and tennis footwear, a number of orders have recently been turned away because the company, which is represented solely by Terrence McCarthy, is not able to take over any additional contracts at present. After the installation of a new vulcanizing plant, the shoe output was increased fifty cases daily.

* * *

A number of additions and improvements are being made at the plant of the National India Rubber Co., Bristol, upon which a large force of men are at work. An addition of considerable size is being placed on the east end of the calendaring department building, and ground was broken a few days ago for an addition to the north boiler room. The paper box and printing departments are also to be enlarged and to receive additional equipment.

The unusually large amount of business that is being done at present at the National's factory and the large quantities of rubber shoes to be made, to fill future orders, necessitates the material enlargement of several of the departments, and in order to do this new buildings, or additions to present structures, must be erected. It is reported that orders for tennis shoes alone, that will require several months to fill, have already been received. At the present time there are about 3,200 persons employed at the plant.

It is planned by the National Co.'s officials to equip the watch men, both day and night, with uniforms, and to have night watch-

men to patrol the streets and squares in the vicinity of the company's plant.

The Revere Rubber Co. has just completed the installation in its plant on Valley street, Providence, of one of the largest Boland patented sand-blast machines made by the manufacturers, for use to sand-blast automobile steel truck rims. Before the solid rubber tire is put on the rim every particle of rust must be removed, and this is done by sand-blasting. The new machine is double. Each part is fitted with a revolving spool, on which the different sized rims are placed, and as the rim revolves, the sand is forced against the face of the rim.

The blower that furnishes the air blast is a four-cylinder Boland patented positive pressure, which discharges seven hundred cubic feet of air per minute. It occupies a floor space of 24 by 76 inches, the weight of the machine being 5,000 pounds and the speed 150 revolutions per minute. A 10-hp. motor is used to operate the blower and sand-blast. This new machine is dustless and self-contained. The operator simply places the rim to be sand-blasted on the revolving spool, closes the door, and the operation proceeds.

* * *

The International Rubber Co., Barrington, is defendant in a damage suit for \$25,000 filed recently in the Superior Court for Providence County by lessees of oyster beds. Another corporation in Barrington is sued in similar proceedings. Eddie B. Blount and Mary E. Blount, of Warren, Rhode Island, are the plaintiffs in the cases. They claim that refuse from one or both of the corporations named flowed across the oyster beds and destroyed the shell fish during a period of five years, causing great damage.

* * *

The Washburn Wire Co. is preparing to erect an addition to its plant at Phillipsdale, which will be 81 x 86 feet on the ground and 31 feet in height.

The George C. Moore Co., Westerly, has been incorporated under the laws of Rhode Island to manufacture elastic webs, with a capitalization of \$100,000. The incorporators are George C. Moore, Eleanor C. Moore, Emma C. Moore, Thomas F. Moore and John V. Moore.

* * *

Edward M. Guild, widely known throughout New England, left his home at Bristol, on the evening of November 9, for New York, on his way to San Francisco. He sailed November 20, on the "Shinyo Maru," for Sumatra, where he will enter the employ of the General Rubber Co. at its great rubber plantations.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

THE outlook for the rubber factories is as bright as a new dime. But a dime is a poor simile—they're dealing in dollars, followed by a pleasing array of plump and prosperous zeros. The war, of course, has added its quota to sales, but there is a large and growing demand for rubber products that have nothing to do with war requirements. The growth in the domestic sales of automobiles is notable, and rubber factories look forward to an exceptional spurt in this industry next year—which of course means more tires. Price cutting in automobiles has gone to great extremes, but it is reported that tires will not follow suit by any further reduction than that made at the beginning of 1915, any change in price being in the opposite direction. Increase in the cost of fabric and crude rubber has been lessening tire profits for the last half of the year.

* * *

The B. F. Goodrich Co. is erecting a new machine shop, and additional machinery has been ordered. Although the present

capacity of the plant is over 14,000 tires a day, the directors intend bringing it up to 20,000.

Goodrich common dividends will not be declared before the January meeting, in order that the result of the full year's operations may be considered.

The Goodrich company is now using a black tread on all tires. This tread has been used on "Silvertowns" for the past two years and proved highly satisfactory. It also gives a distinctive appearance to the car.

The pension plan adopted by the Goodrich company is deservedly popular among the employees, one of whom was recently given absolutely free life and accident insurance and a retirement pension proposition.

At the Taisho Exposition in the island of Nippon during the past year, all the Japanese manufacturers, and also the companies doing a considerable business in Japan, exhibited their products. For the excellence of its display of safety treads, wireless truck tires, belts, packing, etc., the Goodrich company has received a gold medal.

* * *

In addition to the five buildings begun last spring and now nearing completion, the Firestone Tire & Rubber Co. has placed contracts for floor space amounting to nearly three acres. When the latest additions are completed, the total floor space of the Firestone plant will be over 31 acres. A new storage and warehouse is being added, and two other factory buildings.

The clubhouse for employees built by the Firestone company is rapidly being completed. A tunnel will be constructed, leading from the plant to the clubhouse, to prevent the crowding and congestion among the employees at the noon and evening hours.

* * *

The fiscal year of the Goodyear Tire & Rubber Co. ended October 31, with gross receipts of over \$36,000,000. This is \$5,000,000 in excess of the total of last year and \$11,000,000 over that of 1913. Over 2,000,000 tires were made during the year, and the present rate of production nearly doubles that amount.

The forthcoming report of the Goodyear company, it is predicted, will show earnings of more than 40 per cent. on the common stock.

A new 7-story addition to the Goodyear plant is being constructed, at a cost of \$125,000.

Following a tire mileage investigation among Goodyear users, 1,000 tires were found that averaged a mileage of 9,974 miles. The Goodyear company displayed the investigated tires in the windows of its various branches, each tire being tagged with the name of the owner, the size of the tire, and the number of miles service it had given.

Over 100 couples attended the Goodyear dance given by the social committee of the company on November 18, the Goodyear orchestra playing the entire evening. These dances are to be a regular feature, and another will be held in three weeks' time.

* * *

The Kelly-Springfield Tire Co., which prides itself upon making only a high-priced automobile tire, is turning out 1,500 a day, keeping its factory constantly going on a 24-hour schedule. The company is in the truck tire field, also, and expects to make 400 truck tires daily after January 1.

* * *

At the annual meeting of the Miller Rubber Co. on November 11, a quarterly dividend of 3 per cent. was declared, increasing the common stock dividend from 10 to 12 per cent. President Jacob Pfeiffer reported that sales for the year ending June 30, 1915, were \$25,000,000—an increase of 30 per cent. After paying 7 per cent. on \$400,000 preferred stock and 10 per cent. on \$1,000,000 common, the company added \$303,243 to surplus, making a total reserve of \$832,000. In one year the Miller company has increased its floor space from 6½ to 21½ acres. One of the new buildings, containing 98,358 square feet, will be ready for operation by January 1.

The Aluminum Flake Co. is building a new factory on its property at Barberton, which will give three times the present capacity. The company still maintains offices in the Ohio Building at Akron.

The Portage Rubber Co. is adding to its plant at Barberton, and will increase its tire capacity to about 800 tires per day.

The General Rubber Manufacturing Co., whose incorporation was mentioned on page 78 of the November issue of THE INDIA RUBBER WORLD, has offices in the Ohio Building, with a factory in East Akron. The company will manufacture automobile accessories.

The Adamson Machine Co. is putting up a 160 x 80 foot addition to its steel foundry for a 10-ton open hearth furnace, to make open hearth steel castings.

* * *

Bertram G. Work, president of The B. F. Goodrich Co., has purchased 30 acres of land at Oyster Bay, Long Island, where he plans to build a summer home.

At the dinner given on November 15 at the Portage Club by President George Bates of the chamber of commerce, F. A. Seiberling, president of the Goodyear Rubber Co. and a director in the national chamber, spoke on the work of the latter organization.

As chairman of the Community Christmas Committee, Mr. Seiberling presided at a committee meeting in the chamber of commerce rooms on November 17 which was attended by 30 representatives of Akron public organizations, for the purpose of deciding upon plans for the holiday entertainment. It is planned to abandon the idea of having one large Christmas tree, as was done last year, and, instead, to hang illuminated electric stars at downtown street intersections as a reminder of the Christmas spirit.

"Johnny Y.," a 5-gaited saddle horse that has won many blue ribbons and is worth thousands of dollars, has recently become the property of Mr. Seiberling.

Roy G. Harris, of the Firestone Tire & Rubber Co., returned recently from an extended stay in Russia, where he has been selling tires.

* * *

The rubber companies, especially those manufacturing tires, will exhibit at the second annual automobile show to be held in the Akron Winter Garden, December 11 to 18.

Many of our rubber men are planning to attend the annual banquet of the Rubber Club of America, Inc., in New York, on January 28.

The police department is considering installing tandem cars in place of the motor cycle now used for pursuing the wrongdoer. The tandem cars can carry two policemen, one sitting behind the other. The frame of the car is formed like that of an automobile and is mounted on four light wheels. These cars were introduced into this country from England. It is said they are capable of making 80 miles an hour.

CHICAGO RUBBER NOTES.

The Illinois Rubber Co., whose incorporation was mentioned on page 26 of THE INDIA RUBBER WORLD for October, is located at 214-216 W. Kinzie street, and is making a general line of mechanical rubber goods.

The Chicago Mold & Machine Co., 970 Montana street, is making a general line of molds and cores for mechanical rubber goods and tires. They are specializing in a pad mold for making composition, canvas, or leather backs for horse shoe pads.

The Dutch Guiana Culture Co., of which L. C. Lawton is president, with offices in the Lytton Building, recently shipped 12,000 glass rubber latex cups to the company's plantation in Dutch Guiana. The cups were made by the United States Glass Co., Pittsburgh, Pennsylvania.

The Williams-Bowman Co., formerly of 171 N. Greene street, is now located in its new plant at 1947 S. Fifty-fourth avenue. This company makes molded plumbers' specialties.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

RUBBER AND THE BUDGET, ETC.

THE effect of the Excess Profit Tax of 50 per cent on the various rubber plantation companies is the only matter in connection with the rubber interest which is being actively and acrimoniously discussed. It certainly does not seem fair that a small company which has made an increased profit of a thousand or two should have to pay up while an older one, which has made large profits at about the same figure for the previous three years should pay nothing. The suggestion that all rubber companies should pay a tax of 20 per cent. or so has been proposed as being much more equitable and as likely to bring in a larger sum. If this proposal is not accepted it would only be on the ground that other industries would probably claim the same sort of thing and necessitate an extensive alteration in the whole scope of the tax.

Turning to another topic, it is noteworthy that although our army has increased in the last year and is still increasing, supplies and equipment are well in hand and there is an absence of the rush and get-things-anywhere spirit noticeable a year ago. Practically all rubber goods, including hospital requirements, can now be bought by the public at ordinary prices. This applies to army clothing, some contracts for which were placed in America a year ago, and to all equipment, it is understood, except rubber thigh boots. An order for 70,000 pairs of these was placed in the United States during the last few months and this only because it was impossible to obtain the required number in British and Canadian factories. The labor question has not been acutely felt so far in our rubber works, because in normal times women are always largely employed. Now, however, with Lord Derby's recruiting scheme in operation, it is inevitable that some deficiency and dislocation will be manifest, and we may expect that women will invade departments to which they have been strangers hitherto.

Reverting for a moment to the Excess Profit Tax, two important concessions by the Chancellor of the Exchequer may be mentioned: first, the average of two years' profits in place of three may be taken as the datum line; second, new plantation companies just emerging from the development stage are to be compensated for past losses by the allowance of a high datum line varying with the length of development period.

The recent advance in price of plantation rubber is due to steady buying by manufacturers fearful of being found short. Some little nervousness no doubt exists in certain quarters as to the maintenance of the open waterway from the East, in view of the recent development of the war, but apart from this there certainly seems only two good reasons to apprehend a further rise in freight, and also shipping delays. The details of the new government control of merchant shipping are not yet announced, but it may be taken for granted that the present increased requisition of shipping by the allied governments will lead to further delay and expense in obtaining goods from the Far East. On a former occasion I referred to the regulations specially drawn up by the Manchester Chamber of Commerce to guide the authorities with regard to the exportation of cotton cloth suitable for aeroplane use. Now, however, it is announced that special permits relating to this class of goods will not be operative, and that all applications for the export of cotton goods will be dealt with by the War Trade Committee in London. An agitation is on foot for the establishment of a

branch office of this committee in Manchester, as being conducive to saving of time and the interests generally, of the important cotton trade.

LAWN TENNIS BALLS.

The feature of the past season was, as might have been expected, the dearth of tournament and match play, and the consequent small demand for balls, and at the present time there seems little likelihood of a happier state of affairs for next year. Although the well-known brands of balls were on the market, there were numerous complaints that the quality of some of them was not up to the accustomed standard, though the prices were unaltered. Complaints, it is said, met with no response or sympathy, which presumably may be attributed to the small amount of business doing. It is the purveyors of luxuries who have been the hardest hit by the war and, among such, sport-outfitters are prominent. I hear that dealers have been advised of a rise of 1s. per dozen balls for next season, owing to the advance in price of materials and labor. The ordinary ball has the felt or melton cover sewn on after the rubber ball is completely finished, and in the case of best quality balls I have not heard of any complaints arising from this procedure. In a recent patent of E. C. Wisden-Luff and John Wisden & Co., Limited, sport-outfitters, the cover is put on with rubber cement and the vulcanization of the ball is afterward effected, or if previously semi-vulcanized, it is then completed. Among other claims for this ball I note that it is said to be less porous and will consequently last longer. If this claim is substantiated in practice, the patent should prove of more value than many patented improvements in rubber manufacture.

The obituary notice in the October issue of THE INDIA RUBBER WORLD of Mr. A. G. Spalding has been read with interest by many, who, though familiar with the sports depots of Spalding Bros. in London and the provinces, knew nothing of the rise and development of the firm. The Spalding make of lawn tennis balls is well known, though it has not yet been officially adopted by the Wimbledon authorities.

RUBBER CHEMICALS.

There has been a considerable rise in solvent naphtha, which has gone from 10d. per gallon to 2s. 4d. The makers say that this is entirely due to the large demand from the rubber works, which seems rather surprising, because the proofers are by no means so rushed with work as they were a year ago, when solvent was at a much lower level. It is a significant fact that the rise in solvent naphtha has synchronized with the withdrawal of benzol from the open market, the whole supplies of this commodity now having been requisitioned by the War Office in connection with a certain development in the manufacture of explosives. Solvent naphtha, which should consist of xylol, but has, according to the state of the market in the past, often contained benzol and toluol, is now exclusively xylol and is not in demand for the manufacture of explosives, and only to a limited extent for the coal tar color industry. But it can be used for certain purposes instead of its lighter homologues mentioned above. These other uses, as well as a reduction in the output, have no doubt had an effect upon the price. With regard to solvent naphtha the future will depend somewhat upon how much Scotch shale spirit is available, this solvent being largely used in Scotland. That lower prices are not in prospect, however, is evidenced from the

fact that contracts for the supply of solvent naphtha over 1916 have been entered into at the price of 2s. 2d. per gallon.

The exportation of aniline, hitherto permitted under license, is now entirely prohibited. The price has soared up to 2s. 6d. per pound, a fact which I may say is not due to any increased demand, but because of decreased production, owing to the non-availability of benzol, from which it is made.

Another chemical used by rubber manufacturers and reclaimers which has advanced considerably in price, is caustic soda. The British production has been in demand by neutral countries formerly supplied from Germany, and this, coupled with a good home demand, has led to a shortage. A good deal has been coming from America despite the rise in freight from 12s. 6d. to £3 per ton, and has been sold here at prices varying from £20 to £27 per ton for 74 to 76 per cent. c. i. f. Liverpool. In the case of several chemicals, of which there is a shortage for one reason or another, market quotations must not be read to literally, as urgent wants in individual cases have had to be met, with the result that varying prices have been recorded in a limited period of time.

Sulphur, which up to recently has been exported by permit, cannot now be exported at all, a matter which affects some of our rubber chemical manufacturers.

Zinc oxide at 9d. per pound is now a luxury and it has not experienced the fall in price shown by the metal.

Litharge is another compounding ingredient which has risen in price, and altogether it will be seen that the rubber manufacturer who is buying now and not getting deliveries of naphtha and other requirements under contracts made some time ago, has a good deal to worry him. Similarly, those who are still supplying naphtha and other chemicals which have risen, under contracts made a year ago, are not unnaturally grumbling at the position in which they find themselves.

In these strenuous times, one never knows what the next week may bring forth with regard to the disposition of chemical products, the needs of the state, rather than of the individual, having necessarily to be satisfied first. I am not going to enlarge upon this somewhat cryptic utterance except by saying that it is not altogether improbable that difficulty may be experienced in getting supplies of certain chemicals, unless they are required for government contract.

AFRICAN WORLD AND RED CROSS FETE.

A. Staines Manders and Miss D. Fulton, whose organizing ability the rubber trade knows and appreciates, are preparing to hold, in London, a "Cape to Cairo Fair and Red Cross Fete". This is in the line of special work they have been doing, free, since the great war began. The fair will be a direct and very effective aid to the "African World and Red Cross Work" which, since August, 1914, has done a great deal for Red Cross and hospital work in England, Belgium, France, Russia, Italy, Egypt, etc. The "African World Work" is under the patronage of the Queen of the Belgians and the honorary president is Mrs. Louis Botha, of Pretoria. The fair will be held at the Great Central Hall, Westminster, London, December 15, 16 and 17. It will, in a word, be "Africa in London" and a wonderful collection of native works and curios from nearly every country in Africa will be on exhibition. There will also be a series of special lectures and moving picture films covering such industries as gold and diamond mining, ostrich feather farming, etc., etc.

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

"UNDER GOVERNMENT CONTROL"

The influence of the war on British manufacturing industries capable of executing war orders, and the activity of the Hon. David Lloyd George, Great Britain's Minister of Munitions, in making such establishments subservient to campaign requirements, is revealed in recent communications received at this office from well-known British rubber manufacturing concerns. The following legends were conspicuously displayed on their stationery: "Under Government Control," "Controlled Establishment Under Munitions of War Act 1915," "This Establishment Is Controlled Under Munitions of War Act 1915."

RUBBER REGENERATING CO., LIMITED, FURNISHES AMBULANCE.

A very practical charity, particularly at the present time, is the war ambulance. The illustration shows a modern ambulance furnished and operated by the Rubber Regenerating Co., Limited, Manchester, England. This particular ambulance, by the way, is not only non-sectarian, but it is international in its charities.



AMBULANCE DONATED BY RUBBER REGENERATING CO., LTD.

"ARTIFICIAL RUBBER" IN ENGLISH TIRES.

Rubberine, Limited, London, England, the manufacturers of "Rubberine," a special tire filler, advise THE INDIA RUBBER WORLD that nearly one-half of their product of late has been taken by the government for filling the tires of armored cars, lorries, kitchen cars, and ambulances. An interesting point is that pneumatic tires returned from the front for re-filling, although riddled with shrapnel bullets, had served their purpose until the car had gotten safely back to its base.

Dr. Joseph L. Torrey, of the Northwestern Rubber Co., Limited, of Liverpool, England, was a recent visitor to the United States. E. E. Buckleton, the president of the company, usually makes the annual American trip, but as he is suffering from an accident, not serious, happily, Dr. Torrey took his place.

Bertram G. Work, president of The B. F. Goodrich Co., sailed the latter part of November for London. It is understood that he plans a brief absence only.

Hard rubber goods when exposed to sunlight a considerable length of time, turn gray, due to the action of sunlight on the rubber compound. This can easily be remedied. The shop-worn hard rubber article is first freed of dust and then washed with ammonia, after which it is well rinsed in pure cold water, thoroughly dried and finally polished with whiting and a soft cloth. It is important that no hot water be used, for the heat would cause the hard rubber article to warp and lose its shape.

The French Rubber Situation.

By Our Regular Correspondent.

HERE in France, news and information circulate more by word of mouth than through publication channels, and for this reason it is no easy matter to give a complete review of conditions, as one cannot ask too many questions or make too extensive inquiries without raising uncomfortable suspicion. The whole country is heart and soul in the war and commercial as well as industrial conditions, though secondary, are improving daily.

When the order to mobilize came, a year ago last August, all able-bodied men, regardless of rank or occupation, were called to arms from factories and commercial institutions. This state of affairs continued until after the battle of the Marne, when the situation was mastered and steps taken to repair past mistakes.

We had an army for defensive purposes only, and a new one had to be created.

That done, we started reorganizing and adapting ourselves to new conditions. Technical experts and skilled labor were released from the armies and put to work in the factories. Attention was first given to factories working for the essential needs of our defenders. Heavy artillery was created, railroad lines constructed, the production of ammunition organized, the aviation corps provided not only with great numbers of new machines, but also with new types of planes and motors, and our motor transportation service increased and perfected.

Like other industries, the rubber industry was paralyzed by the mobilization. But rubber is essential to modern warfare, and so our rubber factories were soon reorganized and set to work again with skilled labor and technical management, as were also the munitions factories which, by the way, like our most important rubber factories, are in Central France and the Paris district well behind the "front."

The leading branch in our rubber industry has always been the manufacture of tires, and of all rubber articles, tires are the most important in modern warfare. Soldiers now ride in motor cars, and motor cars and trucks keep them supplied with food and munitions. Motor tractors draw the big guns that are constantly changing positions and motor trucks supply these monsters of destruction with ammunition. These motors all use tires, either solid or pneumatic, but always rubber. For this our factories were well prepared and as soon as the needed labor and staffs returned from the army, work went on night and day, so smoothly and effectively that our factories supply all our rubber needs and are now able to extend their trade in the Orient, in South America and in Africa. Our rubber factories are now abundantly provided with skilled workmen and technical experts. They are not only producing tires, but also all the rubber sun-

dries and surgical goods required by our army and navy medical service. The only branch somewhat curtailed is the mechanical, and this is because the Germans still occupy the most important market for mechanical rubber goods in Northern France.

As a rubber manufacturing district, the Northern departments were never as important as those of the Paris district or of the central part of this country, but they were our largest consumers of manufactured rubber. The mines of the Nord and of the Pas-de-Calais produced at least two-thirds of our total output of coal. Our spinning industry was in Lille, our linen industry in Armentiers, Lille and St. Quentin, our cloth and woolen industries were in Roubaix and Tourcoing. Enormous furnaces, rolling mills, steel works, electrical and mechanical construction works, glass

works, etc., were scattered along the Belgian frontier throughout the districts now occupied by our enemies. These districts were second only to the Paris district in industrial wealth, while agriculturally they were the richest in France. All these industries were great purchasers of mechanical rubber goods; likewise the great distilleries, breweries,



INNER TUBE DEPARTMENT IN FRENCH FACTORY.

sugar factories and other industries of Northern France.

The fine pleasure cars as well as the ponderous trucks that traversed the northern "pavés"—the cobble-paved roads of Northern France—all used rubber tires, and their number was exceeded only by those of the Paris district. This once beautiful and wealthy part of our country is closed to us now, but we hope to have it back before many months.

Although the invaded provinces were not great producers of rubber goods, it may be of interest to your readers to know that there were about 50 plants in these districts engaged in the manufacture of rubber goods and the production of chemicals, ingredients, accessories and machinery used in the manufacture of rubber and gutta percha. The following are some of the leading concerns:

SOFT AND HARD RUBBER GOODS.

Bans, Lhomme, Nord; Gustave Boinet & Cie., St. Quentin, Nord; E. Degraeve, Roubaix, Nord; Buttrulle & Masquelier, Fourmignies, Nord; Usines du Coq Français, Roubaix, Nord; Destrieux & Cie., Pont-à-Marcq, Nord; Michel Jackson, Halluin, Nord; Lefebvre, Pont-à-Marcq, Nord; Mazure, Roubaix, Nord; F. Montreux & Tyberghien, Halluin, Nord; Volber, Valley, Aisne; Flinois, Colmant & Cavelier, Lille, Nord; Dedale-Rivelois, Roubaix, Nord; and Colonial Rubber Co., Thiant, Nord.

CHEMICALS AND COMPOUNDING INGREDIENTS.

Société Anonyme des Mines de Malhidano, Noyelles-Godault, P. D. C. (chalk); Gortschalk, St. Amand-les-Eaux, Nord (chalk); Société Française La Baryte de Commines, Commines, Nord (barytes); Lufbery & Chardonniere, Chauny, Aisne (rub-

ber substitute); Madame J. Lefrant & Cie., Ham, Somme (chemicals).

RUBBERIZED GARMENTS.

G. Boinet & Cie., St. Quentin, Aisne; Coustoux, Roubaix, Nord. TIRES.

Durandal, Lécuse, Nord (pneumatic); Lecerf, Péronne, Somme (pneumatic); Vittu, Lille-St. Maurice, Nord (pneumatic); Colonial Rubber Co., Thiant, Nord (pneumatic); Lecoutre, St. Quentin, Aisne (solid rubber tires).

NON-SKID TREADS, TIRE STUDS, ETC.

Dutrieux & Cie., Le Quesnoy, Nord; Place & Meurisse, Lille-St. Maurice, Nord; Vittu, Lille-St. Maurice, Nord; Colonial Rubber Co., Thiant, Nord; Le Vulcaïn, Péronne, Somme.

TIRE FABRICS.

Coinse & Lambert, Armentières, Nord; Destrieux & Cie., Pont-à-Marcq, Nord; Dutilleul, Armentières, Nord; Laroche & Lechat, Lille, Nord; Legault, Armentières, Nord; Trèves, St. Quentin, Aisne.

RUBBER WORKING MACHINERY.

A. Questroy & Fils, Lille, Nord; Delattre & Cie., Ferrière-la-Grande, Nord.

Belgium and the districts now invaded furnished practically all the cotton, linen, hemp and jute fabrics used by our rubber manufacturers, and under present conditions we are obliged to import these from America and Great Britain. We are also importing large quantities of compounding ingredients from your country. In this connection I wish to inform you that much of these commodities that figure in your statistics as exports to England are re-shipped to France.

IMPORTS OF CRUDE RUBBER.

France has always been, comparatively speaking, a large user of Brazilian rubber, and most of this was imported through Havre; but now Havre is no longer in direct communication with South America and our direct imports of Brazilian rubber have almost totally ceased. The following comparative statistics will give you a fair idea of our crude rubber market as it now stands.

Imports During the First Five Months of

From—	1913.	1914.	1915.
Brazil	5,369,980	3,133,960	264,440
Great Britain	16,191,900	9,005,930	7,318,305
French Congo	263,560	223,520	99,660
Senegal	21,960	2,430	16,940
Other colonies (French)	2,757,700	1,255,760	985,820
British Indies	535,920	1,639,440	241,780
Other countries	7,029,880	5,181,660	1,221,000
Total	22,361,900	20,442,620	10,147,940

If you compare the first two lines of these statistics you will note that the large decrease in Brazilian imports is compensated by a substantial increase in our imports from England. I believe much Brazilian rubber reaches us via English ports. The fact that Para rubber now passes through England before reaching this country has increased its cost to us by at least 5 cents a pound, and our importers are now endeavoring to obtain the re-establishment of direct communication between France and Brazil.

Although the war has somewhat increased the cost of raw materials, there has been no radical increase in the prices of rubber goods here. Tires, hose, belting, packing, rubberized garments, etc., can all be had at normal prices.

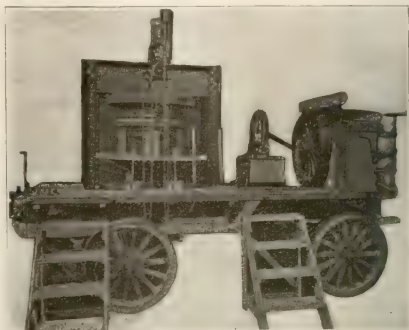
There have been reports of gasoline shortage and, in fact, prices have increased. But the real cause is the difficulty in securing exchange, and the rubber industry has not been affected. There is no reason for alarm, for all our gasoline comes from America, which in normal times furnished as high as four-fifths of our requirements for this commodity.

Many trade papers have ceased, or at least curtailed the scope of their publications, but the old-established papers are still going strong, among these your contemporary, "Le Caoutchouc et la Gutta Percha," which, although obliged to delay publication at first, has recovered wonderfully. The October issue of our only rubber paper contained 67 advertisements, of which 9 were British, 3 American, 1 Dutch, 3 Swiss, 1 Spanish and 1 from a firm in the

invaded territory. This compares very favorably with the average of this paper previous to the war, when of 146 advertisements published, 22 were German, 1 Austrian, 5 Belgian, 2 Dutch, 5 American, 15 British, 2 Swiss, 1 Italian, 1 Russian, and 15 from French territory now invaded.

Our government has prohibited the exportation of the following commodities of interest to rubber and gutta percha manufacturers:

Rubber, balata, gutta percha, whether crude, reclaimed or in



HYDRAULIC PRESS MOUNTED ON TRAILER TRUCK.

the shape of waste, including hard rubber scraps; amyl, methyl, and ethyl alcohols; pitch tar rosin, turpentine; cotton and cotton waste; copper ore, pure metal or alloys; sulphuric and acetic ether; insulated wire and cables; mineral oils, crude or refined; benzene, benzol, toluene, etc.; fabrics suitable for making balloons; motor vehicles and pneumatic tires. Sulphur, copper, motor vehicles and rubber tires can be exported under special license to America, Great Britain, her colonies and possessions; to the French Colonies, Japan, Montenegro, Russia, Servia and to that part of Belgium still held by the gallant Belgian army.

The poisonous gas used by the Germans, which at first worked such havoc, has now been minimized by anti-gas helmets, impermeable to chlorine gas, made of light rubberized fabrics, closed at the throat by a draw string, and completely covering the wearer's head. Goggle-like mica plates afford vision to the wearer, who breathes through a perforated detachable cup containing a cloth saturated with a solution of hyposulphite and bicarbonate of soda, which react with chlorine and hold it in harmless combination.

It has been said that modern war is motor war, which is certainly very true. As I stated in the beginning of this letter, motor vehicles are indispensable and have greatly lessened the importance of railroads in military operations.

MOBILE REPAIR SHOPS.

The wastage of motor vehicles has been far less than many of your war correspondents would lead you to believe. Our armies are well equipped with means for making necessary repairs. Besides large permanent repair shops at the bases in the rear, we maintain flying repair stations immediately behind the battle lines. The mobility of these "parcs" is secured by mounting the machine tools on special trailer trucks coupled behind the travelling workshops which are arranged on large motor trucks. These flying repair shops are able to do all repairs, even those of the most complicated nature.

Tires, of course, are used up in enormous quantities. The heavy solid rubber tires, used on motor trucks, are mounted on steel detachable rims which are forced on the permanent rims of the

wheels by a hydraulic press. For this work we have designed self-contained hydraulic presses mounted on trailer trucks, and adjustable to any size solid rubber tire.

The war has greatly modified conditions in France, even to the remotest districts, but we have adapted ourselves to war conditions and it has become part of our every-day life. Confidence is general—no one doubts our final victory. Before the battle of the Marne we had little hope. Since that great success, however, confidence has returned, and although it is not manifested in a boisterous manner, it is firm in the hearts of our countrymen.

RUBBER TRADE IN JAPAN IN 1914.

By Our Regular Correspondent.

IN my contribution to the April issue of THE INDIA RUBBER WORLD I endeavored to give as complete statistics as possible of the rubber trade of this country during the calendar year 1914, but I will take up the subject again to give your readers more detailed information which I have obtained from statistics published recently by our Department of Finance and by the Customs authorities in Kobe.

Although no large rubber factories existed here during 1914, there were in operation quite a number of small plants, with the result that our consumption of crude rubber increased substantially in spite of war conditions and the incidental hindrance to commerce. The war embargo on rubber injuriously affected our rubber manufacturers. It stopped the supplies of crude rubber we were in the habit of obtaining from Singapore, until the latter part of October, when small quantities were obtained from the Straits Settlements port. The decrease in arrivals of crude rubber was soon felt by our manufacturers, for here in Japan it is not customary to speculate in crude rubber, especially when prices have a downward tendency. Purchases are made only as the material is needed; so that when the embargo came there were no large supplies of crude rubber on hand in this country.

Singapore being practically closed to us we endeavored to obtain crude rubber from Dutch India, only to find that the entire production there had been bought up by American interests. America and England were still open as sources of supply, but the distance and the high freight rates made purchases there impracticable. We did buy some crude rubber in England, but not in sufficient quantities to keep all factories going, and before the end of the year quite a number of our small rubber manufacturing concerns were obliged to close their plants. The larger factories were able to hold out until February and March of the present year when many of these were obliged to shut down because no crude rubber was available.

In former years we purchased much Borneo and British Indian wild rubber through the Singapore market, chiefly because our manufacturers were under the impression that wild rubber was better than the plantation product, but also because the former was cheaper. We now recognize that in the end plantation rubber is cheaper than the wild varieties because there is no loss in washing and refining, as there is with Borneo and British Indian rubber which come to us in a very impure state. Of course, the prices for plantation rubber are not as high as formerly, but the same applies to wild rubber and to South American and African grades. We have a good opinion here of African rubbers, but most of our manufacturers are not equipped to handle them advantageously. The following table shows the prices we paid for the most popular grades of crude rubber at different times during the year 1914:

	January and February.	July.	August and September.	November and December.
Borneo rubber... per 100 pounds	\$52.50	.....	.....	\$67.50
British Indian rubber.....	70.00	.....	.....	67.50
Plantation sheet.....	62.50	\$57.50	\$56.00	67.50
Fine Pará hard cure.....	75.00	.....	.....	75.00

Pale crépe is the plantation type most used here, followed by smoked crépe and scrap, in order of importance.

During the past year the following rubber factories were our principal consumers of crude rubber: The Yokohama Electric Wire Works, Limited, Yokohama; the Mitatsuchi Rubber Manufacturing Co., Tokio; the Toyo Rubber Co., Limited, Tokio; the Nipon Rubber Co., Limited, Tokio; the Fujikura Electric Wire & Rubber Co., Limited, Tokio; the Nipon Wire & Cable Co., Limited, Tokio; the Kakuichi Rubber Co., Osaka; the Osaka branch of the Yokohama Electric Wire Works, Limited, Osaka; the Sumitomo Rubber Works, Osaka; the Hirana Rubber Works, Osaka; the Matsuda Rubber Works, Osaka; the Asai Rubber Works, Osaka; the Shimada Rubber Works, Osaka; the Asuma Leather Co., Osaka; the Bando Belt Co., Osaka; the Dunlop Rubber Co. (Far East), Limited, Kobe; the Naigai Rubber Co., Limited, Kobe; the Kawaji Rubber Co., Kobe; the Settsu Rubber Co., Limited, Nishinomiya and Hyogo; the Kamenofuchi Rubber Co., Fakae and Hyogo; the Kyushu Electric Wire Co., Limited, Fukuoka, and the Chugoku Rubber Works, Hiroshima. Of the total of our imports of crude rubber two-thirds were consumed in Osaka, Kobe and other western parts of Japan and the rest in Tokio and Yokohama.

During 1914 a new application for rubber was discovered here and now rubber solution is being used for coating the thongs of the wooden clogs which almost all Japanese wear when out of doors. The widespread use of wooden clogs and this application of rubber to them is bound to increase our consumption of crude rubber.

The Japanese Imperial Steel Works at Wakamatsu, Japan, have placed a contract with a British firm for the installation of a benzol plant with an annual output of 2,400 tons of benzol.

JAPANESE EXPORTS OF RUBBER GOODS.

The most important items of our exports of manufactured rubber goods are rubber insulated electric wires and jirikisha and bicycle tires, which we ship in quantities to China, Kwangtung Province, Hong Kong, British India, the Straits Settlements, Dutch India, Great Britain and other countries. From the statistics I gave in my April contribution you will note that our exports in these articles increased more than 50 per cent. in 1914 as compared with the preceding year. The increase in these exports started in August, which goes to show that they were largely due to the stoppage of European shipments in these lines. By December the orders in hand were far in excess of our capacity to deliver; our output, as before said, being curtailed by the crude rubber embargo of our allies. Prices, however, were good and our manufacturers made substantial profits.

The following table shows weights and values of our exports of rubber goods through the leading ports of this country for 1914:

From—	Pounds.	Value.
Kobe	872,594	\$536,970
Yokohama	6,930	4,214
Other ports	3,262	1,951
Total	882,786	\$543,135

As will be noted, most of these exports were made through the port of Kobe. The following table shows the destinations of exports of rubber goods through this port for 1914:

From—	Pounds.	Value.
China	341,244	\$399,823
Kwangtung Province	2,305	1,139
Hong Kong	2,913	1,345
British India	32,689	39,644
Straits Settlements	221,572	141,041
Netherlands India	250,223	158,327
Great Britain	5,788	3,205
Other countries	10,890	846
Total	872,594	\$536,970

RUBBER PLANTATIONS.

Rubber plantations here promise well for the future. We now have some 88,000 acres under *Hevea*, which will produce about 5,000 tons of rubber per year when in full yield. Our present consumption of crude rubber amounts to about 2,000 tons per annum.

Rubber Planting Notes.

RUBBER AND INTERPLANTED COFFEE.

STATEMENTS that the growth and yield of *Hevea* trees were adversely affected by interplanting with coffee have in several instances induced Java planters to cut out the interplanted coffee. This not only meant the direct loss of the coffee—cost of original planting and cultivation and annual yield—but in many instances the rubber trees were injuriously affected. As a result of experiments conducted at the Besoeiki Experiment Station, Djember, Java; Director A. J. Ultee issues a circular in which he admits that the interplanted coffee apparently retards in some degree the growth of *Hevea* trees, according to the planting distance, the method of working employed and local circumstances. Also cutting out of the interplanted coffee often injuriously affects the rubber and before deciding upon this step planters should ascertain by careful experiment the probable effect the removal of the coffee would have on future rubber production.

RUBBER EXPORTS FROM UGANDA IN 1914-15.

The Department of Agriculture of the Uganda Protectorate has published its annual report, covering the year ending March 31, 1915. So far as rubber growing is concerned, the situation there is certainly not what it might be with proper attention and enterprise.

The report discloses that "all the rubbers are neglected with the exception of Para, and, although the area ready for tapping is comparatively small, the results obtained give every encouragement to persevere, as it is an excellent standby and costs comparatively little to bring into bearing when coffee is grown as a catch-crop."

Apparently there are no circumstances peculiar to the soil or climate tending to obstruct abundant and profitable growth, the state of the business being mainly due to neglect. The tabular statement at the end of the report bears this out so far as the wild rubber is concerned. In 1911, 898 hundredweight of wild rubber was exported and in 1914, the banner year, 123,984 pounds; while for the year ending March 31, 1915, none is recorded. On the other hand, plantation rubber amounting to but 552 pounds in 1911, has gained steadily, and by the latest figures, was exported during 1914-15 to a total of 22,056 pounds, valued at £1,838 (\$8,944).

Of course Uganda has suffered by the past slump in the market, the harvest of 1913-14, amounting to 19,454 pounds of plantation rubber, bringing £2,934 (\$14,278).

EFFECT OF TAPPING SYSTEMS ON RUBBER YIELD.

At a well-attended meeting of the Committee of Agricultural Experiments recently held at the Peradeniya Agricultural Experiment Station, Ceylon, L. E. Campbell, the rubber research chemist, explained the relation between the physiological effects of tapping on *Hevea* and the production of dry rubber; or, in other words, the connection between rubber yields and storage of reserve starch. Some of the trees under examination were tapped with the half-herringbone to left of the channel, over one-fourth of the tree's circumference. The first section of the tree, tapped continuously on alternate days, gave a yield equal to that tapped daily in alternate months. In the second section there was an advantage of 4 per cent. in favor of daily tapping in alternate months. In the case of the full herringbone on half the circumference there was an advantage of 16 per cent. in favor of regular alternate day tapping in the first sections, but in the second

sections the advantage was much smaller. The yields from trees tapped daily in alternate months and those tapped continuously every other day were apparently about equal. The experiment demonstrated that with the systems under observation it makes little difference as far as latex yield is concerned, whether the trees are tapped continuously on alternate days, or daily in alternate months throughout the year.

INDIVIDUAL PLANTATION BRAND.

On his return from England to Ceylon recently, M. Kelway Bamber reported that some large manufacturers expressed the opinion that estates should have an individual mark stamped on all rubber produced, thus enabling the manufacturer to know the estate which produced the rubber best suited to his purpose.

RESTRICTION ON BELGIAN CONGO RUBBER EXPORTS.

An ordinance of the acting Governor-General of the Belgian Congo, dated August 1, 1915, prohibits the exportation of rubber from the colony, except to Great Britain, France, or to the port of New York. It is necessary to obtain special permits for exports to New York, which must be consigned to the Belgian Consul at New York, subject to the terms of the rubber guarantee.

AFRICAN RUBBER AND PLANTATION COMPETITION.

For some years past African wild rubber exports have displayed a consistent tendency to decrease in volume, largely owing to the low prices prevailing in rubber markets and the ever-increasing production of well-prepared plantation rubber. The average price during 1914 was the lowest in the last five years. Exports of crude rubber from the British Gold Coast Colony fell from 3,223,365 pounds in 1910 to 654,133 pounds in 1914, the value of the exports declining during this period from £385,875 [\$1,877,861] to £21,632 [\$105,272]. It is also claimed that the prices offered are no longer sufficient to encourage enterprise in this languishing industry.

DYNAMITE TO FERTILIZE RUBBER PLANTATIONS.

Experiments are being conducted in Malaya to test the value of dynamite for liberating the plant-foods in the soil. The Department of Agriculture of the Federated Malay States is conducting these experiments and reports that the trees in dynamited plots increase more rapidly in girth than trees in similar plots not dynamited. The average increase of girth of trees in dynamited plots was, at the end of six months, .48 inch, and, at the end of nine months, .71 inch greater than trees in neighboring plots. The plot treated with dynamite comprised two acres and was blasted in March, 1914.

RUBBER EXPORTS FROM TRINIDAD AND TOBAGO

The exportation of rubber has been prohibited during the war, but, according to the report of the Agricultural Society of Trinidad and Tobago, 810 pounds of this commodity was shipped, on special permits, in June. Exports from January 1 to July 1 of 1914, amounted to 3,785 pounds; for the same period in 1913, 1,505 pounds, and for the first six months of 1912, 2,076 pounds.

"Rubber Machinery," Mr. Pearson's newest book, filled with valuable information, is now ready. Price \$6.

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED OCTOBER 19, 1915.

- N**O. 1,157,541. Remountable tire rim. R. C. Ball and I. F. Vetter—both of Portland, Ore.
- 1,157,156. Vehicle wheel rim. R. W. Dick, assignor to Louis Rastetter & Son, a partnership existing between E. Rastetter and W. C. Rastetter—both of Fort Wayne, Ind.
- 1,157,202. Surgical apparatus with elastic lining. U. C. Bates and J. McLeland—both of Seattle, Wash.
- 1,157,439. Combined hot water bottle and syringe. M. E. Shaw, Mason City, Iowa.
- 1,157,447. Hair curler having an elastic member. M. W. Stoddard, Minneapolis, Minn.
- 1,157,536. Self-retaining hose washer formed of resilient material. H. P. Herron, Los Angeles, Cal., assignor to H. Mueller Manufacturing Co., Decatur, Ill.
- 1,157,559. Rim with tire retaining flange. J. W. Lewellen, Ridal, Pa.
- 1,157,564. Dust cap for tire valves. H. A. Mason, assignor of one-fourth to S. G. O'Neill and one-fourth to W. E. Quigley—all of Taunton, Mass.
- 1,157,574. Self-retaining coupling washer. R. Mueller, assignor to H. Mueller Manufacturing Co.—both of Decatur, Ill.
- 1,157,763. Tire tool. J. P. Cunningham, York, Neb.
- 1,157,822. Valve for pneumatic tire. B. E. Taylor, Oak Park, Ill.
- 1,157,905. Soft rubber stopper. W. G. Rodiger, Chicago, Ill.
- 1,157,928. Non-skid attachment for tires. J. L. Duff, Cambridge, Ohio.
- 1,158,039. Pneumatic closet seat buffer. T. J. Flory, Washington, N. J., assignor to American Sanitary Works, New York, N. Y.
- 1,158,053. Rubber heel insert. O. T. Hutchison, Wagon Mound, N. Mex.
- 1,158,075. Tire protector with an inner permanent rubber layer and an outer renewable rubber layer. J. Richardson, Buffalo, N. Y.
- 1,158,139. Truss with an inflatable body. R. P. McCollum, Philadelphia, Pa.
- 1,158,183. Wheel having a solid tire. N. Cornfield, New York, N. Y.
- 1,158,206. Toy balloon. R. Griffith, assignor to Miller Rubber Co.—both of Akron, Ohio.
- 1,158,353. Springwheel. D. Cave, assignor of one-third to H. M. George and one-third to H. Bowman—all of Lincoln, Neb.

ISSUED NOVEMBER 2, 1915.

- 1,158,526. Shoe having an elastic fabric upper. T. W. Meredith, New York, N. Y.
- 1,158,573. Device for attaching rubber heels to shoes. G. B. Sinclair, Georgetown, Me., and L. O. Whitman, Marlboro, Mass.
- 1,158,604. Inner tube for pneumatic tire. T. J. Webster, Haverhill, Mass., assignor to Reliance A. C. Co., Inc., New York, N. Y.
- 1,158,607. Anti-skidding armor for tires. H. W. White and A. T. Shelton—both of Atchaf, Cal.
- 1,158,780. Gas dispensing dental device. R. M. Bolton, Chicago, Ill.
- 1,158,850. Tire carrying wheel. U. S. Renne, Smithland, Iowa.
- 1,158,859. Washboard with rubber attachment. B. Rudloff, Bayonne, assignor to E. Dorison, Jersey City—both in New Jersey.
- 1,158,897. Composition of matter, including guayule, to be used for rendering paper impervious to air and moisture. E. S. Coleman, Beatrice, Neb.
- 1,158,943. Combination tip for crutches and canes. S. E. Loudon, Riverdale, Ill.
- 1,159,015. Hozz nozzle. H. Gibbs, assignor to W. D. Allen Manufacturing Co.—both of Chicago, Ill.
- 1,159,026. Tire. W. M. Hill, Minnate, Neb.
- 1,159,027. Fountain pen feed bar. J. W. Hobson, Jr., Bayonne, N. J.
- 1,159,068. Tire. C. J. Monet, assignor of one-third to R. B. Perry—both of Washington, D. C.
- 1,159,086. Life preserver. J. J. Puskanen, Chisholm, Minn.
- 1,159,090. Vehicle wheel with annular flexible tread. T. Richards, Chicago, Ill.
- 1,159,097. Vehicle wheel with annular flexible tread. T. Richards, Chicago, Ill.
- 1,159,101. Device for making H. Stelzel, assignor to the Pappe & Thomsen, work, Heine & Bernh. Dräger—both of Lubeck, Germany.
- 1,159,143. Patch for tires. R. W. Wheeler, Akron, Ohio.
- 1,159,160. Hot water belt. A. C. Beringer, Bellwood, Neb.
- 1,159,244. Tire. T. Midgley, Sr., assignor to The Midgley Tire & Rubber Co.—both of Lancaster, Ohio.
- 1,159,250. Vaginal irrigator. F. Moulton, Sunnyside, Wash.
- 1,159,263. Valve stem seal for pneumatic tires. J. J. Wooty, Los Angeles, Cal.
- 1,159,273. Remountable tire. I. K. Baker, assignor to American Rubber Co.—both of Chicago, Ill.
- 1,159,283. Remountable tire. W. B. Brown, assignor to American Chain Co., Inc.—both of Bridgeport, Conn.
- 1,159,324. Bath fixture. C. A. Minnie, Wellsburg, assignor of two-ninths to P. Seltner, McMechen, and two-ninths to G. Orden, Wellsburg—all of West Virginia.

(Chemical and Process Patents will be found on pages 113 and 114.)

(Machinery Patents will be found on page 122.)

ISSUED NOVEMBER 9, 1915.

- 1,159,362. Catalametal appliance. F. C. Cornell, New York, N. Y.
- 1,159,444. Reinforcement for pneumatic tire. M. Patrick, Geraldine, South Canterbury, New Zealand.
- 1,159,448. Elastic in-shoe sole undergarment. C. M. Walker, Kansas City, Mo.
- 1,159,496. Rubber dam clamp. J. W. Ivory, Philadelphia, Pa.
- 1,159,503. Fountain brush. B. D. Knickerbocker, Chicago, Ill.
- 1,159,507. Shower bath curtain. A. E. Lang, Buffalo, N. Y.
- 1,159,538. Cushion tire. W. Shimon, Pocahontas, Iowa.
- 1,159,578. Rubber heel. F. X. Bibeault, Waterbury, Conn.
- 1,159,578. Rubber heel for shoes. C. Gambino, Birmingham, Ala.
- 1,159,760. Elastic tire for wheels. C. H. Genth, Philadelphia, Pa.
- 1,159,797. Wheel rim. J. A. Reid, Wentville, Mo.
- 1,159,799. Shock absorber. F. T. Roberts, Trenton, N. J., assignor to The Paramount Rubber Co., Cleveland, Ohio.
- 1,159,864. Pneumatic tire. A. L. Pearce, assignor to Pearce Arrow Tire & Rubber Manufacturing Co.—both of Philadelphia, Pa.
- 1,159,882. Toy comprising rubber cord and ball. E. C. Zipfel, Omaha, Neb.
- 1,159,925. Wheel tire. A. Gearing, New York, N. Y.
- 1,159,961. Resilient wheel. H. Kupperian, Milwaukee, Wis.
- 1,159,972. Rubber heel. G. K. Maltby, New York, N. Y.
- 1,160,007. Tire. W. F. Stark, Mauretown, Va.
- 1,160,023. Swimming appliance. H. White, Ho-nan fu, China.
- 1,160,112. Artificial foot. O. L. Savitz, assignor of one-third to E. S. Rabenold and one-third to H. E. Wink—all of Allentown, Pa.

UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent upon the filing of the application.

*Denotes Patents for American Inventions.

- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, OCTOBER 6, 1915.]
- 13,907 (1914). Spring wheel with inflatable inside cushions. R. T. Park, 15 York street, South Melbourne, Victoria, Australia.
- 13,926 (1914). Swimming appliance. J. D. Russell, 9 Victoria Road, High Road, Kilburn, London.
- 14,045 (1914). Detachable rim. E. Goody, Glenhorth, Trinity Square, Llandudno.
- 14,079 (1914). Detachable rubber pads for horseshoes. G. Hardman, Wharf Street Shoeing Forge, Preston, Lancashire.
- 14,236 (1914). Armored tire covers. C. M. Gautier, 27a Bangalore street, Putney, London.
- 14,244 (1914). Respiratory mask or face piece with pneumatic cushion. S. J. Richards, Hereford House, Craig avenue, and J. E. Spickett—both in Pontypriid, South Wales.
- 14,257 (1914). Renewable rubber-faced wearing parts for horseshoes. A. Beydell, Hacken Farm, Daresbury, and J. Longworth, 522 Blackburn Road, Asley Bridge—both in Bolton, Lancashire.
- 14,356 (1914). Spring tire with rubber tread blocks. R. J. Wickham, 74 Southview Road, Hornsey, London.
- *14,412 (1914). Wheel tire. H. J. Gillette, 328 Lyon street, N. E., Grand Rapids, Michigan, U. S. A.
- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, OCTOBER 13, 1915.]
- 14,465 (1914). Rubber and wire tire armor and repair material. A. H. Greenfield, 92 Earl's Court Road, London.
- 14,633 (1914). Tire inner lining. J. W. H. Dew and Azulay Syndicate—both of 8 Laurence Pountney Hill, Cannon street, London.
- 14,649 (1914). Wheel tire. W. H. Williams, Bromford Lane, Erdington, Birmingham, and O. Farkash, 145 Pilgrim street, Newcastle-upon-Tyne.
- 14,989 (1914). Pneumatic massage appliance. E. Winton-Charteris, 25 Devonshire street, Higher Broughton, Manchester.
- 15,057 (1914). Rubber protectors for the glass in headlights of electric motor cars. L. Renault, 15 Rue Gustave Sandoz, Billancourt, Seine, France.
- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, OCTOBER 20, 1915.]
- 15,172 (1914). Garter. A. W. MacLeod, 32 Victoria street, Westminster.
- 15,184 (1914). Non-skid hand comprising rubber plugs. A. T. Hughes, 27 Gloucester Road, New Green, Surrey.
- 15,198 (1914). Spring wheel with rubber block cushions. J. G. Daw, Wellfield, Llanelli, Carmarthenshire.
- 15,336 (1914). Golf club with rubber insert. W. Hillman and F. M. Hillman—both of Keredey, near Coventry.
- 15,351 (1914). Rubber heel. E. K. Czarnowski, 7 Garbarska, and A. Siekacz, 22 Kopernika—both in Cracow, Galicia, Austria.
- 15,401 (1914). Syringe. H. E. Moul, 1 St. Ann's Chambers, Orchard street, Westminster.
- 15,436 (1914). Wheel tire. F. W. Howarth, 10 New Court, Lincoln's Inn Fields, London.
- 15,455 (1914). Tire valve. M. C. Schweinert, 238 Palsade avenue, West Hoboken, New Jersey, U. S. A.
- 15,475 (1914). Regenerative breathing apparatus. R. H. Davis, 187 Westminster Bridge Road, London.

- *15,581 (1914). Spring wheel with pneumatic cushions. W. M. Hoffman, 25 Gallatin avenue, Buffalo, New York, U. S. A.
- 15,583 (1914). Waterproof bandage having a pocket for compresses. P. Nebel, Schonau, near Chemnitz, Germany.
- *15,625 (1914). Rubber closet seats and lids. M. J. Whelan, Muskegon, Michigan, U. S. A.
- *15,626 (1914). Vulcanite coated wooden closet seats and lids. M. J. Whelan, Muskegon, Michigan, U. S. A.
- *15,627 (1914). Closet seats and lids. M. J. Whelan, Muskegon, Michigan, U. S. A.
- *15,628 (1914). Rubber coated wooden closet seats. M. J. Whelan, Muskegon, Michigan, U. S. A.
- 15,660 (1914). Tire tube lined with puncture sealing device consisting of a rubber honeycomb structure and rubber filling. D. J. Chappell, 52 College Hill, Llanelli, Carmarthenshire.
- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, OCTOBER 27, 1915.]
- 25,592 (1913). Eye and ear protector. C. de Bobory, Gyöngyös, Hungary.
- 25,711 (1913). Chain with pieces of rubber. P. Rodewald, 35 Tempelhofer-Ufer, Berlin.
- 27,652 (1913). Vehicle wheel having removable rubber plates. G. Silvestri, 23 Wehrgrasse, and A. Findenig, 23 Belvedere-gasse—both in Vienna.
- 28,009 (1913). Ebonite device for teapot handle. Mappin & Webb and R. E. Smith—all of Royal Works, Sheffield.
- 28,806 (1913). Corset with section of elastic webbing. H. Bunte, 22 Grabenstrasse, Dusseldorf, Germany.
- 1,902 (1914). Breathing apparatus having rubber diaphragm and breathing bag. J. Parker, Steinhofstrasse, Cowdenheath, Fife-shire.
- 2,548 (1914). Galvanic battery. Van Raden & Co., 567 Foleshill Road, and M. Metz, 50 Berkeley Road—both in Coventry.
- 4,175 (1914). Massage appliance comprising a compressible ball. C. Greb, 40 Hohenzollernstrasse, Cassel, Germany.
- 4,614 (1914). Rubber in apparatus for modelling felt. C. J. Angeli, 11 Schulstrasse, and L. Russ, 4 Grafenstrasse—both in Darmstadt, Germany.
- *7,786 (1914). Elastic protector and cleaner for tobacco pipes. H. E. Hagmueller, 626 Washington street, Hoboken, New Jersey, U. S. A.

- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, NOVEMBER 3, 1915.]
- 15,694. Waterproof canvas air bag to increase ships buoyancy. J. W. Cook, 10 Bedford, Stafford.
- 15,708. Illuminated signal with rubber strips between the glass plates. A. E. Lucas, 61 City Road, Birmingham.
- 15,737. Rubber in filter of vacuum cleaning apparatus. L. L. Ferguson, 6501 South State street, Chicago, U. S. A.
- 15,756. Fly swatter. C. E. Hodson, West street, Bourne, Lincolnshire.
- 15,771. India rubber capsules for bottles. F. W. Ingram, Felstead street, Hackney Wick, London.
- 15,798. Ebonite electrode covering for electric resistances. H. Herapath, 255 Hampstead Road, and M. J. Railing, 67 Queen Victoria street—both in London.
- *15,834. Air tubes for wheel tires. W. M. Reason, Pontiac, Mich., U. S. A.
- 15,869. Game appliance comprising a light inflated ball. E. M. Maxwell, Manor House, Clapham Common, London, and E. L. Allen, Fairview, Beoley, Redditch.
- 16,004. Ebonite buttons. Firm of F. Everts, Bad Homburg von der Höhe, Germany.
- 16,106. Detachable rim. G. B. Filmer, 83 Sillock street, South Hill, Moose Jaw, Saskatchewan, Canada.
- 16,115. Tire valve. H. P. Kraft, 219 Godwin avenue, Ridgewood, N. J., U. S. A.
- 16,129. Shaving stick cases. W. A. Gatten, 23 Haus, Grunwald in Isarthal, near Munich, Germany.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

- 476,444 (November 5, 1914). Improvements in elastic wheels. A. Spreight and E. W. Meredith.
- 476,457 (April 23). Anti-mud tire casing. E. Lapointe.
- 476,479 (April 24). Rigid and floating metallic casing for pneumatic wheels with buttons and holes for attaching. J. A. Meunier.
- 476,514 (November 14). New perfected system for attaching spare auto-mobile wheels and tires. W. J. Parker.
- 476,571 (April 27). Pneumatic wheel. J. O. Strassbach.
- 476,622 (November 28). Improved vehicle tires. C. Halle.
- 476,695 (December 8). Armored casing for pneumatic tires. A. Rosa.
- [NOTE.—Printed copies of specifications of French patents can be obtained from R. Bohet, Ingénieur-Conseil, 16 avenue de Villiers, Paris, at 50 cents each, postpaid.]

THE GERMAN EMPIRE.

PATENTS ISSUED (With Dates of Validity).

- 288,249 (January 13, 1914). Hollow truss. Frantz Dieckmann, Wormserstrasse, 16, Berlin.
- 288,457 (November 13). Tire casing. Bruno Salzmann, Feldstrasse, 16, Berlin-Steglitz.
- 288,632 (March 19). Nipple. Supplement to patent No. 287,382. Carl Cade, Herford-Westfalen.
- 288,200 (June 30). Nipple. Carl Erwin Martin, Seumstrasse, 75, Leipzig-Schleusig.
- 288,118 (May 12). Objects made of rubber or similar substances. Dr. Emil Franz, Vienna. Represented by J. Apitz and F. Reinhold, Patent-lawyers, Berlin SW 11.

- 288,688 (April 16, 1913). Method for attaching interchangeable heels of rubber or similar material. Richard Volker and Fa. Hermann Sieg, Bielefeld.

TRADE MARKS.

ISSUED OCTOBER 19, 1915.

- 73,675. Heimbach Rubber Heel Co., Duluth, Minn. Illustration of a circle with a hand holding a rubber heel. For rubber heels.
- 79,996. Union Lock Stitch Co., Boston, Mass. Illustration of a circle with the words *Comfort and Service* in white letters on a black background and the words *The Merrick Welt* in black letters on a white background. For boots and shoes made of rubber, leather and canvas.
- 81,667. United States Rubber Co., New Brunswick, N. J., and New York, N. Y. Illustration of a circle with an inner circle of black with the initials *U S* in white letters on same. For rubber boots and shoes.
- 82,317. United States Rubber Co., New Brunswick, N. J., and New York, N. Y. Diamond design with the words *Knu-Shu* in white letters on a dark background, the letters being increased successively in size so that the initials *U* and *S* stand out. For boots and shoes having fabric uppers and rubber soles.
- 83,381. The Charles Williams Stores, Inc., Brooklyn, N. Y. Diagram of the East River with the Brooklyn Bridge. For bathing caps, rubber caps, raincoats and rubber collars, etc.
- 84,772. The Republic Rubber Co., Youngstown, Ohio. Picture of old Father Time with the words *Old Man Mangle* on his hat. For a monthly periodical publication.
- 87,272. The Goodyear Tire & Rubber Co., Akron, Ohio. Illustration of a tire with a dark background with the words *Goodyear Tire* and a white center with the initials *S F*. For elastic vehicle tires.
- 88,463. The Frederick W. Lipps Co. of Baltimore City, Baltimore, Md. The word *Society*. For chewing gum, etc.
- 89,182. Hood Rubber Co., Watertown, Mass. The word *Daysha*. For rubber boots and shoes, rubber overshoes, and rubber soled canvas boots and shoes.
- 89,314. Hood Rubber Co., Watertown, Mass. The word *Leisure*. For rubber boots and shoes, rubber overshoes, and rubber soled canvas boots and shoes.

ISSUED OCTOBER 26, 1915.

- 77,642. American Heyl Co., Inc., New York, N. Y. A swastika with the words *American Heyl Company, Colors, Quality*. For rubber, etc.
- 81,471. National India Rubber Co., Bristol, R. I. Illustration of a campfire with a melting pot. For rubber and canvas boots and shoes.
- 81,472. National India Rubber Co., Bristol, R. I. The word *Campfire*. For rubber and canvas boots and shoes.
- 86,408. The Republic Rubber Co., Youngstown, Ohio. A plate with the words *The Republic Rubber Co., Youngstown, Ohio, Oil, Producer and Well*. For being made of rubber and cotton.
- 88,280. The Miller Rubber Co., Akron, Ohio. The words *Miller Tires Geared To The Road*. For rubber tires.

ISSUED NOVEMBER 2, 1915.

- 87,804. The Goodyear's Metallic Rubber Shoe Co., Naugatuck, Conn. The words *Goodyear Rubber*. For rubber shoes.
- 87,993. Revenswald & Weil, Chicago, Ill. Illustration of a feather with the words *No-Water*. For rubberized sheeting or fabric.

ISSUED NOVEMBER 9, 1915.

- 85,761. A. G. Spalding & Bros., Jersey City, N. J. The word *Perma*. For vulcanizable cement for golf balls.
- 88,362. Hood Rubber Co., Watertown, Mass. Illustration of a horseshoe. For pneumatic and cushion tires of rubber and rubber and fabric.
- 88,533. C. A. Crane, Cleveland, Ohio. The words *Chin-Chin*. For chewing gum.
- 89,265. The Clark Manufacturing Co., Boston, Mass. Picture of a Scotchman in his native dress with the words *Hoot Mon*. For hose supporters.
- 89,450. C. B. Shane Co., Chicago, Ill. The word *Arerento*. For rain coats.
- 89,535. The Clark Manufacturing Co., Boston, Mass. The word *Superba*. For elastic webbing.

DESIGNS.

ISSUED OCTOBER 19, 1915.

- 47,999. Garter. M. E. Hammond, Bridgeport, Conn., assignor to The Thos. P. Taylor Co., a corporation of Connecticut.

ISSUED OCTOBER 26, 1915.

- 48,029. Tire tread. DeL. P. Harris, New York, N. Y.
- 48,040. India rubber sole pad for boots and shoes. W. W. Phillips, assignor to Phillips' Patents, Limited—both of London, England.
- 48,041. India rubber sole pad for boots and shoes. W. W. Phillips, assignor to Phillips' Patents, Limited—both of London, England.
- 48,042. Rubber heel pad for footwear. W. W. Phillips, assignor to Phillips' Patents, Limited—both of London, England.

ISSUED NOVEMBER 2, 1915.

- 48,066. Vehicle wheel tire. M. D. Kuhlke, Akron, Ohio.
- 48,068. Garter. D. E. Latham, assignor to Double Grip Garter Co., Inc.—both of New York, N. Y.

ISSUED NOVEMBER 9, 1915.

- 48,138. Garter. C. J. White, assignor to The C. J. White Manufacturing Co.—both of New Britain, Conn.

Review of the Crude Rubber Market.

NEW YORK.

NOVEMBER began with a quiet, steady market, reflecting the firmness in plantation sorts on the London market.

First latex and smoked sheet sold at 62 cents for spot, January-March deliveries at 61 cents. Upriver fine was quiet at 57 cents.

On November 6 heavy buying was reported in London and prices commenced to advance. During the following week the rise was so rapid that on Thursday, November 11, quotations were withdrawn. This New York movement was evidently due to actual buying orders and continued to develop strength, owing to persistent bidding by buyers in the London market. November 23, First latex and prime ribbed were quoted in a strong market at 85 cents and January-March deliveries at 82 cents. Upriver fine was firm at 76 cents for spot.

This sudden buying movement, attended by an advance of 20 cents a pound in the price of representative plantation grades, has been attributed to various causes. For instance, the Panama Canal is hopelessly blocked and the Suez canal closed indefinitely; German submarines are operating in the Mediterranean. So much for rumors; the facts are that the local market is simply marking time, with the dealers "sitting tight" and watching the London cables. Little actual business was done in spot and nearby and the bargains in futures, quoted a few days ago, have been marked up by the rising tide of higher prices.

Later in the month, the market weakened and prices declined as the strong London buying movement ceased. Plantation grades showed a loss of eight to ten cents a pound from the high levels of a few days before.

LONDON.

The activity that set in late in October has continued into November and the demand is strong and urgent. Available supplies appear to be somewhat limited, despite the fact that stocks are increasing. The arrivals are about 2,000 tons above the average for the month, but deliveries are slow and uncertain. Official figures for the week ending November 6, 1915, show arrivals of 1,311 tons and deliveries of 1,027 tons. Corrected stock figures are 6,417 tons against 3,262 tons on the same date a year ago. Prices have advanced strongly from 2s. 6½d. (62.3 cents), the price last week for spot Standard crépe, to 2s. 9½d. (67.9 cents), quoted for the same grade on November 12, 1915. January-June crépe was quoted at 2s. 7½d. (63.5 cents). Hard fine Pará advanced 2s. the pound. Activity in the market continued and considerable business was done for Russian account. The demand for futures covering all of next year has also been quite noticeable.

November 18, the market advanced sharply and closed strong with Standard crépe and Smoked sheet spot selling at 2s. 11½d. (71.9 cents). The upward trend of prices continued, supported by active buying orders, and on November 24, Standard crépe and Smoked sheet spot were 3s. 4d. (81 cents).

JAVA.

At the private auction held in Batavia on September 10, 1915, 34,239 pounds were offered and 14,382 pounds sold, crépe bringing 59.5 cents. On September 17 there were 51,533 pounds catalogued and 36,498 pounds sold at normal prices. The auction of September 24 brought out 33,383 pounds, of which 3,348 pounds were sold. The only grade of crépe offered sold for 55.5 cents. On October 1 there were 17,908 pounds offered and 13,303 pounds sold at lower prices.

SINGAPORE.

At the auction held on September 22, 1915, 275 tons were offered and 178 tons sold. Smoked sheet ribbed and Fine pale crépe sold up to 54 cents per pound. On September 29 there were 256

tons catalogued and 207 tons changed hands. Prices for prime qualities were unchanged from last week. The auction of October 6 reflected the better tone of the London market, and prices advanced in an active market. Fine pale crépe sold for 62.5 cents per pound.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and November 29, the current date:

PARA.	Dec. 1, '14.	Nov. 1, '15.	Nov. 29, '15
Upriver, fine, new.....	71 @	56 @ 57	68 @
Upriver, fine, old.....	73 @ 75	57 @ 58	69 @
Islands, fine, new.....	63 @ 61	54 @	65 @
Islands, fine, old.....	62 @ 64	55 @	66 @
Upriver, coarse, new.....	52 @ 53	44 @ 44½	58 @
Upriver, coarse, old.....	45 @	38 @	53 @
Islands, coarse, new.....	32 @ 33	27 @ 27½	35 @
Islands, coarse, old.....	32 @	27 @	35 @
Camelina.....	33 @ 35	28 @ 29	35 @
Caucho, ball, upper.....	52 @ 53	44 @ 45	58 @
Caucho, ball, lower.....	50 @ 51	42 @ 43	56 @

PLANTATION HEVEA.

Smoked sheet ribbed.....	82 @ 84	Spot.....	61½ @ 62	78 @
First latex crépe, 1 Year by.....	75 @ 76	Jan. June.....	60 @ 62	75 @
First latex crépe, 1 Forward.....	75 @ 76	Sept. Dec.....	61 @ 62	75 @
Fine sheets and biscuits, un-smoked.....	66 @ 68	Jan. June.....	60 @	75 @
.....	58 @ 65	Sept. Dec.....	60 @	75 @

CENTRALES.

COHIBA.....	46 @ 47	41 @ 42	52 @ 53
Esmeralda, sausage.....	26 @ 42	41 @ 42	52 @ 53
Nicaragua, strip.....	45 @ 46	40 @ 41	53 @ 55
Mexican plantation sheet.....	45 @ 46	40 @ 41	53 @ 55
Mexican, scrap.....	45 @ 46	40 @ 41	53 @ 55
Mexican, slab.....	45 @ 46	40 @ 41	53 @ 55
Mangabeira.....	42 @ 44	37 @ 38	46 @ 48
Mangabeira, sheet.....	42 @ 44	37 @ 38	46 @ 48
Balata, sheet.....	52 @ 53	51 @ 52	56 @ 58
Balata, block.....	43 @ 44	44 @ 45	45 @ 46

AFRICAN.

Lopori, ball, prime.....	No supply	53 @ 54	65 @
Upper Congo, ball, red.....	No supply	52 @	64 @
Masai, red.....	No supply	52 @	64 @
Southern Nigeria.....	No supply	52 @	64 @
Cameroon, ball.....	45 @	39 @	60 @
Benuea.....	34 @	32 @	39 @ 40
Acacia, flake.....	38 @	37 @	39 @ 40
Rio Niger, Nigeria.....	53 @	53 @	63 @ 64
Komaki Nigeria.....	53 @	53 @	60 @ 61

FAST INDIAN.

Avanti.....	47 @	50 @ 54
Pontianak.....	63 @	61 @ 7
Gutta Suk.....	11½ @ 12	11½ @ 12
Barrage H.....	40 @	38 @ 40
Gutta Percha.....	2.50 @	
Red Macassar.....		1.85 @ 2.00

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows: "The situation as regards commercial paper remains unchanged from what we have reported for several months past, the demand continuing good and the best rubber names going freely at 4@4½ per cent. (with occasionally something extra choice a little lower), and those not so well known 5@5½ per cent."

PRICES FOR OCTOBER (NEW RUBBER).

	1913.	1914.	1915.
Upriver, coarse.....	\$0.73 @ 0.83	\$0.64 @ 0.66	\$0.55 @ 0.57
Upriver, fine.....	27 @ 29	43 @ 45	43 @ 45
Islands, fine.....	67 @ 72	49 @ 53	50 @ 54
Islands, coarse.....	28 @ 29	26 @ 28	26 @ 28
Camelina.....	36 @ 38	29 @ 32	28 @ 29

IMPORTS FROM PARA AT NEW YORK.

[The Figures Indicate Weights in Pounds.]

OCTOBER 25.—By the steamer *Rio de Janeiro* from Pará:

	Fine.	Medium.	Coarse.	Caucho.	TOTAL.
Meyer & Brown.....	41,500	4,900	132,900	20,400	199,700
Henderson & Korn.....	34,800	86,300	8,000		129,100
Arnold & Zenas.....	50,900		16,300	5,500	72,700
G. Amisick & Co.....	15,700	700	27,700		44,100
I. T. Johnstone & Co.....			13,200		13,200
H. A. Aslett & Co.....			5,400	4,700	10,100
Total.....	108,100	46,100	281,800	38,600	474,600

NOVEMBER 1—By the steamer *Dents* from Pará and Manaos:

	Fine.	Medium.	Coarse.	Cancha.	Total.
Meyer & Brown	138,200	20,000	97,600	21,100	276,900
General Rubber Co.	200,100	26,300	50,900	8,100	285,400
Arnold & Zeiss	11,600	8,100	46,000	40,300	216,000
Henderson & Korn	49,700	28,200	64,300	12,800	155,000
Robinson & Co.	115,900	300	10,400	10,900	141,100
J. T. Johnstone & Co.	18,000	1,000	50,000	7,000	93,000
Aldens' Successors, Ltd.	22,900	25,400	36,000	400	84,700
W. R. Grace & Co.	74,100	2,400	5,300	—	81,800
Hagemeyer & Himmels	28,300	—	—	—	32,500
H. A. Aslett & Co.	—	8,500	19,100	—	27,500
Adolph Hirsch & Co.	—	8,700	3,900	10,900	23,500
G. Amisack & Co.	8,600	—	9,200	—	17,800
Muller, Schall & Co.	3,600	—	—	1,200	4,800
Total	798,000	128,800	400,500	114,700	1,442,000

NOVEMBER 8—By the steamer *Minas Geraes* from Pará and Manaos:

	Fine.	Medium.	Coarse.	Cancha.	Total.
Meyer & Brown	82,600	7,300	38,600	—	128,500
General Rubber Co.	160,500	20,800	57,900	7,200	246,400
G. Amisack & Co.	97,800	4,700	25,500	—	128,000
Arnold & Zeiss	25,000	1,800	57,700	—	84,500
Henderson & Korn	11,900	7,600	55,500	3,900	78,900
Adolph Hirsch & Co.	43,300	—	—	—	43,300
Robinson & Co.	—	—	15,000	—	15,000
H. A. Aslett & Co.	—	—	15,200	—	15,200
Aldens' Successors, Ltd.	3,800	1,500	5,500	—	10,800
W. R. Grace & Co.	7,000	—	—	—	7,000
Total	432,500	43,700	320,900	34,600	831,700

PARA RUBBER VIA EUROPE.

	Pounds.
OCTOBER 26—By the <i>Cristobal</i> —Colon:	
G. Amisack & Co. (Fine)	19,000
G. Amisack & Co. (Caucho)	8,000
W. R. Grace & Co. (Fine)	62,000
W. R. Grace & Co. (Caucho)	10,000
OCTOBER 29—By the <i>Adrian</i> —Liverpool:	
Aldens' Successors, Ltd. (Coarse)	60,000
NOVEMBER 11—By the <i>Colombia</i> —Colon:	
G. Amisack & Co. (Caucho)	7,500
W. R. Grace & Co. (Fine)	7,500

AFRICANS.

	Pounds.
OCTOBER 25—By the <i>Calowade</i> —Hall:	
Aldens' Successors, Ltd.	62,212
OCTOBER 29—By the <i>Den of Ogit</i> —Liverpool:	
Arnold & Zeiss	80,000
General Rubber Co.	33,500
Earle Bros.	6,000
OCTOBER 30—By the <i>Adorgaroch</i> —London:	
Arnold & Zeiss	11,200
OCTOBER 30—By the <i>Chinese Prince</i> —Singapore:	
L. Littlejohn & Co.	11,200
NOVEMBER 1—By the <i>Mungacine</i> —London:	
Edward Maurer Co., Inc.	112,000
Robert Badenhop	234,000
NOVEMBER 4—By the <i>Den of Airle</i> —London:	
Arnold & Zeiss	22,500
NOVEMBER 8—By the <i>Cymra</i> —Liverpool:	
Arnold & Zeiss	65,000
Henderson & Korn	11,200
Fred Stern & Co.	22,500
Rubber Trading Co.	4,000
NOVEMBER 16—By the <i>Santana</i> —Liverpool:	
Henderson & Korn	8,000
Robert Badenhop	4,000
Rubber & Guayule Agency, Inc.	1,500
Various	1,000

CENTRALS.

[This sign, in connection with imports of Central districts, denotes Guayule rubber.]	
OCTOBER 25—By the <i>Morro Castle</i> —Mexico:	
General Export Commission Co.	1,000
OCTOBER 25—By the <i>Rio de Janeiro</i> —Pará:	
Adolph Hirsch & Co.	3,500
Lawrence Johnson & Co.	5,500
OCTOBER 26—By the <i>Metapala</i> —Port Limon:	
Isaac Brandon & Bros.	2,000
OCTOBER 26—By the <i>Guantanamo</i> —Mexico:	
J. Sponges & Co.	20,000
Hall & Rind	1,500
Lambert & R. H. H. H.	1,500
W. A. Ays & Co.	1,000
Haburgers & Stack	1,000
OCTOBER 26—By the <i>Metapala</i> —Port Limon:	
Various	20,000
OCTOBER 27—By the <i>Rio de Janeiro</i> —Pará:	
Various	47,000
OCTOBER 28—By the <i>Metapala</i> —Port Limon:	
G. Amisack & Co.	12,500
M. J. Ays & Co.	1,000
Paul, Stephens & Co.	1,000
M. J. Ays & Co.	1,000
G. Amisack & Co.	1,000
OCTOBER 28—By the <i>Metapala</i> —Port Limon:	
R. B. H. H.	1,000
R. B. H. H.	500
R. B. H. H.	500
NOVEMBER 1—By the <i>Metapala</i> —Port Limon:	
Various	1,000

NOVEMBER 1—By the *Padonae*—Port Limon:

	Pounds.
Isaac Brandon & Bros.	1,000
NOVEMBER 1—By the <i>El Sol</i> —Galveston:	
Various	180,000
NOVEMBER 4—By the <i>Alfianca</i> —Colon:	
G. Amisack & Co.	4,000
NOVEMBER 6—By the <i>San Jacinto</i> —Galveston:	
Various	20,000
NOVEMBER 6—By the <i>Zacapa</i> —Colombia:	
Mecke & Co.	1,300
Caballero & Blanco	200
NOVEMBER 8—By the <i>Minas Geraes</i> —Bahia:	
J. H. Rossbach & Bros.	14,000
Lawrence Johnson & Co.	4,500
NOVEMBER 8—By the <i>Canota</i> —Bahia:	
Adolph Hirsch & Co.	35,000
NOVEMBER 8—By the <i>Calamarez</i> —Port Limon:	
Isaac Brandon & Bros.	500
NOVEMBER 8—By the <i>Mexico</i> —Mexico:	
Graham, Hincley & Co.	7,000
American Trading Co.	17,000
S. Sembrada & Co.	1,000
G. Amisack & Co.	700
H. Marquardt & Co.	500
NOVEMBER 11—By the <i>Eastern Prince</i> —Bahia:	
Adolph Hirsch & Co.	20,000
NOVEMBER 11—By the <i>Colon</i> —Colon:	
Lawrence Johnson & Co.	6,000
G. Amisack & Co.	3,000
W. R. Grace & Co.	3,000
NOVEMBER 12—By the <i>Canillo</i> —Cartagena:	
G. Amisack & Co.	7,500
International Trading Co.	3,500
Caballero & Blanco	400
NOVEMBER 12—By the <i>Concho</i> —Galveston:	
Various	60,000
NOVEMBER 13—By the <i>Esperanza</i> —Mexico:	
Lawrence Johnson & Co.	10,000
J. A. Medina & Co.	10,000
Graham, Hincley & Co.	1,000
NOVEMBER 15—By the <i>Canoas</i> —Bahia:	
Adolph Hirsch & Co.	45,000
NOVEMBER 16—By the <i>Tenados</i> —Port Limon:	
Isaac Brandon & Bros.	3,500
NOVEMBER 16—By the <i>Sisigala</i> —Cortez:	
Rosenthal & Sons	3,500
S. Sembrada & Co.	3,000
Isaac Brandon & Bros.	1,000
G. Amisack & Co.	300
NOVEMBER 18—By the <i>Santa Maria</i> —Colombia:	
Mecke & Co.	1,000
NOVEMBER 20—By the <i>Adisance</i> —Colon:	
Gravenhorst & Co.	8,000
Contant & Co.	500
NOVEMBER 22—By the <i>Morro Castle</i> —Mexico:	
American Trading Co.	6,500
J. A. Medina & Co.	4,500
H. Marquardt & Co.	1,500
Various	10,000

EAST INDIAN.

* Denotes plantation rubber.

	Pounds.
OCTOBER 15—By the <i>Sundland</i> —London:	
Edward Maurer Co., Inc.	14,500
Charles T. Wilson Co., Inc.	33,500
Raw Products Co.	9,000
OCTOBER 17—By the <i>Clough</i> —Liverpool:	
The R. F. Goodrich Co.	22,500
OCTOBER 29—By the <i>Kafue</i> —Colombo:	
Meyer & Brown	270,000
L. Littlejohn & Co.	125,458
Arnold & Zeiss	315,000

W. H. Stiles—Pounds.

	Pounds.
J. T. Johnstone & Co.	23,000
Hood Rubber Co.	22,500
W. R. Grace & Co.	11,200
Henderson & Korn	40,000
Aldens' Successors, Ltd.	21,280
Various	127,762
OCTOBER 30—By the <i>Ordgaroch</i> —London:	
Meyer & Brown	275,000
L. Littlejohn & Co.	140,198
The R. F. Goodrich Co.	425,000
General Rubber Co.	200,000
J. T. Johnstone & Co.	220,000
Robinson & Co.	33,500
Rumsey & Greutert Co., Inc.	56,000
W. R. Grace & Co.	170,000
Aldens' Successors, Ltd.	9,000
Rubber Trading Co.	24,000
Edward Maurer Co., Inc.	24,000
Various	51,000
OCTOBER 30—By the <i>Meana</i> —London:	
Meyer & Brown	200,000
Edward Maurer Co., Inc.	75,000
The R. F. Goodrich Co.	170,000
General Rubber Co.	112,000
Charles T. Wilson Co., Inc.	135,000
L. Littlejohn & Co.	41,800
OCTOBER 30—By the <i>Chinese Prince</i> —Singapore:	
Meyer & Brown	23,490
Goodyear Tire & Rubber Co.	50,000
Edward Maurer Co., Inc.	48,000
The R. F. Goodrich Co.	450,000
L. Littlejohn & Co.	220,000
Charles T. Wilson Co., Inc.	48,000
Rumsey & Greutert Co., Inc.	56,000
W. R. Grace & Co.	170,000
Henderson & Korn	100,000
Arnold & Zeiss	62,500
J. T. Johnstone & Co.	27,000
General Rubber Co.	27,000
Aldens' Successors, Ltd.	60,508
Robinson & Co.	3,000
Core & Herbert	15,000
H. Jeffords	4,000
NOVEMBER 3—By the <i>Minnehaha</i> —London:	
General Rubber Co.	80,000
Charles T. Wilson Co., Inc.	35,000
Aldens' Successors, Ltd.	15,016
Robert Badenhop	11,200
NOVEMBER 4—By the <i>Den of Airle</i> —London:	
General Rubber Co.	180,000
L. Littlejohn & Co.	18,000
Rubber Trading Co.	18,000
Robinson & Co.	45,000
J. T. Johnstone & Co.	26,000
Aldens' Successors, Ltd.	3,000
Various	31,700
NOVEMBER 9—By the <i>Penneche</i> —Paramaribo:	
G. Amisack & Co.	2,500
Arnold & Zeiss	1,500
NOVEMBER 11—By the <i>Mission</i> —London:	
L. Littlejohn & Co.	10,631
NOVEMBER 12—By the <i>Midford Hall</i> —Colombo:	
Meyer & Brown	410,000
General Rubber Co.	367,000
L. Littlejohn & Co.	305,200
Arnold & Zeiss	370,000
Henderson & Korn	27,000
J. T. Johnstone & Co.	27,000
Various	237,800
NOVEMBER 13—By the <i>Lord Sefton</i> —Liverpool:	
The R. F. Goodrich Co.	4,500
NOVEMBER 13—By the <i>Pannona</i> —London:	
Meyer & Brown	35,000
Aldens' Successors, Ltd.	49,494
General Rubber Co.	340,000
J. T. Johnstone & Co.	420,000
Rubber Trading Co.	30,000
Rumsey & Greutert Co., Inc.	35,000
The R. F. Goodrich Co.	110,000
Edward Maurer Co., Inc.	39,500
Robert Badenhop	7,000
Henderson & Korn	2,500
Charles T. Wilson Co., Inc.	2,500
Various	55,306

Plantation Rubber from the Far East.

TOTAL EXPORTS FROM MALAYA.

(From January to dates noted. Reported by Rubber & Co., Singapore.)
These figures include the production at the Federated Malay States, but not of Ceylon.

	Singapore	Malacca	Penang	Port Swet	Total
To	Nov. 31	Nov. 30	Nov. 31	Oct. 15	
Great Britain	20,766,800	61,59,464	15,615,798	22,546,435	65,269,497
Continents	3,667,067	.....	709,753	24,640	4,101,139
Japan	1,336,982	.....	.....	.....	1,336,982
China	144,983	.....	191,733	1,209,710	1,546,426
United States	2,437,200	.....	1,265,067	.....	3,702,267
Australia	281,259	.....	.....	.....	281,259
Total	48,334,291	61,59,464	18,184,930	23,760,785	96,249,470
Same period, 1914	25,420,119	3,579,164	13,801,332	22,840,350	67,640,751
Same period, 1913	16,353,430	.....	9,939,467	24,234,350	48,537,447
Same period, 1912	8,596,675	.....	5,851,230	15,111,164	30,259,069

EXPORTS OF CEYLON GROWN RUBBER.

(From January to October 18, 1914 and 1915. Compiled by the Ceylon Chamber of Commerce.)

To	1914	1915
Great Britain	13,664,349	18,996,919
United States	7,105,957	13,043,672
Belgium	2,984,000	.....
Germany	1,037,415	.....
Australia	308,073	621,977
France	317,912	379,872
Japan	220,700	245,211
Russia	105,210	322,200
Straits Settlements	42,335	119,933
Italy	1,772	.....
Canada	1,050	1,000
Canada and Newfoundland	.....	384,940
Total	26,188,984	34,124,996

(Same period, 1913, 19,656,253 pounds; same period, 1912, 10,058,285.)
The export figures of rubber given in the above table for 1914 include the imports re-exported. (These amount to 3,037,159 pounds.) To arrive at the total quantity of Ceylon rubber exported for that period deduct these imports from the total exports. The figures for 1915 are for Ceylon rubber only.

SINGAPORE.

Guthrie & Co., Ltd., report (October 6, 1915):
Advices received from London during the past few days have indicated a better tone in the rubber market, and this was reflected at the auction held today, prices all round showing substantial improvements.
Very little was being brought in for sale, and the market was keen competition. Fine pale crepe was again in exceptional demand, one lot fetching \$133, an increase of \$4 on last week's best. Fine ribbed smoked sheet was \$3 better \$132. Plain smoked sheet was wanted, the highest price paid, viz. \$125, being \$2 up on the week.

The lower grades shared in the general improvements, all parcels meeting with a ready sale.

Vulcan and loose scraps marked increases of \$1 and \$10, respectively.

Of 222 tons offered, 193 tons changed hands.

The following was the course of values:

	In Singapore	Sterling equivalent	Equivalent
	Pieul.	per pound	per pound
		in London.	in cents.
Sheet, fine ribbed smoked	\$130@132	2 6 1/2 @ 2 6 1/4	61.32 @ 62.33
Sheet, fine good ribbed	.....	.....	.....
Sheet, plain, smoke-dried	125 @ 128	2 5 1/2 @ 2 5 1/4	59.29 @ 60.56
Sheet, plain, smoke-dried	122 @ 125	2 4 1/2 @ 2 5 1/4	58.02 @ 59.29
Sheet, unsmoked	116 @ 124	2 3 1/2 @ 2 5 1/4	55.49 @ 58.79
Crepe, fine pale	131 @ 133	2 6 1/2 @ 2 7	61.83 @ 62.84
Crepe, good pale	127 @ 128	2 5 1/2 @ 2 6 1/4	60.05 @ 61.06
Crepe, fine brown	123 @ 127	2 4 1/2 @ 2 5 1/4	58.53 @ 60.05
Crepe, good brown	116 @ 120	2 3 1/2 @ 2 4 1/4	55.49 @ 57.27
Crepe, dark	110 @ 116	2 1 1/2 @ 2 3 1/4	52.95 @ 55.49
Crepe, black	97 @ 105	1 11 1/2 @ 1 13 1/4	47.38 @ 52.45
Scrap, straight	83 @ 91	1 8 1/2 @ 1 10 1/4	41.30 @ 44.85
Scrap, pressed	80 @	1 9 @	42.57 @
Scrap, loose	60 @ 100	4 1/2 @ 2 1 1/4	14.20 @ 31.18

* Pieul = 135 points.
Quoted in S. S. dollars = 2 1/4 1/2 cents.

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official cablegram received from the colonial secretary, Singapore, announces that the export of plantation rubber from the Straits Settlements during the month of October amounted to 2,641 tons as compared with

4,725 tons in September, and 2,006 tons in the corresponding month last year.

The following is a comparative table showing the export for three years:

	1913	1914	1915
January	784	1,181	2,576
February	743	1,703	2,741
March	898	1,285	2,477
April	762	1,548	1,978
May	814	1,309	3,588
June	812	1,480	2,249
July	1,120	1,584	2,324
August	1,315	1,325	2,395
September	1,057	1,602	4,725
October	1,144	2,006	2,641

Total 9,449 15,023 27,594

These figures include transshipments of rubber from various places in the neighborhood of the Straits Settlements, such as Java, Sumatra, Borneo, and the non-Federated Malay States, as well as rubber actually exported from the colony, but do not include rubber exports from the Federated Malay States.

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram received from Kuala Lumpur announces that the export of plantation rubber from the Federated Malay States during the month of October amounted to 4,320 tons, as compared with 3,334 tons in September, and 2,897 tons in the corresponding month last year.

The following is a comparative table showing the export for three years:

	1913	1914	1915
January	1,311	2,542	3,473
February	1,252	2,364	3,411
March	1,737	2,418	3,418
April	1,626	2,151	2,777
May	1,255	2,069	2,708
June	2,005	2,005	3,403
July	1,781	2,971	3,687
August	2,363	1,850	3,796
September	2,000	2,879	3,334
October	2,160	2,897	4,120
Total	18,785	24,447	34,127

PLANTATION RUBBER EXPORTS FROM JAVA AND MADURA.
Eight months ending August 31.

EXPORTS TO	1914.	1915.	1914.	1915.
Holland	2,581	2,200	20,845	29,262
.....Ficus (to order)	.....	.....	12,932	.....
.....Hevea	160,600	228,800	1,949,200	1,782,000
.....Ficus (to order)	11,000	.....	473,000	4,400
.....Manihot (cacao)	1,266	.....	126,314	67,633
.....Castilloa	.....	7,467	41,950	13,779
Total	174,936	238,467	2,623,961	1,846,174
Great Britain	.....Ficus	9,115	39,180	40,121
.....Hevea	92,400	374,000	2,211,000	3,198,800
.....Manihot (cacao)	.....	3,782	27,744	19,378
.....Castilloa	.....	.....	20,896	68,350
Total	92,400	386,897	2,298,820	3,326,649
Belgium	.....Ficus	.....	462	.....
.....Hevea	17,600	.....	550,000	.....
Total	17,600	.....	550,462	.....
France	.....Hevea	.....	6,600	.....
United States	.....Hevea	6,600	1,111,000	5,198,000
.....Manihot (cacao)	.....	.....	1,034	8,692
Total	.....	.....	99,000	5,207,292
Germany	.....Hevea	6,600	1,111,000	99,000
.....Castilloa	.....	.....	2,735	.....
Total	.....	.....	81,635	18,171
Singapore	.....Ficus	528	328	18,171
.....Hevea	11,000	94,600	173,800	446,600
.....Manihot (cacao)	.....	.....	260	.....
Total	11,000	95,128	174,388	459,771
Japan	.....Hevea	.....	2,200	.....
Other Countries	.....Ficus	249	.....	543
.....Hevea	.....	13,200	.....	99,000
Total	249	13,200	249	99,543
Grand Total	302,785	1,846,897	5,835,415	11,152,926

EXPORTS OF INDIA RUBBER AND CAUCHO FROM PARA, MANAOS AND IQUITOS, DURING OCTOBER, 1915.

	NEW YORK.					EUROPE.					LONDON.	
EXPORTERS	Fine.	Medium.	Coarse.	Caucha.	TOTAL.	Fine.	Medium.	Coarse.	Caucha.	TOTAL.	Total.	Total.
1. Marquis	14,799	7,618	91,792	10,731	130,141	470,076	5,328	150	.....	475,554	605,695	605,695
Suter & Co.	44,799	3,837	42,328	10,212	101,196	.....	1,830	45	5,940	60,699	62,102	101,196
Adelbert H. Alden, Ltd.	340	74	318	.....	1,403	31,188	.....	.....	.....	60,699	62,102	62,102
General Rubber Co. of Brazil	137,578	14,020	100,763	16,442	299,795	53,890	2,550	.....	.....	126,314	325,235	325,235
Pires Teixeira & Co.	53,186	5,870	101,023	13,037	173,116	94,457	7,334	177	580	104,227	277,343	277,343
Zangos, Berrange & Co.	33,046	1,900	856	575	35,837	.....	.....	.....	.....	.....	25,837	25,837
Schumann & Co.	14,500	.....	.....	.....	14,500	.....	.....	.....	.....	.....	14,500	14,500
Smiley Herman & Co.	13,448	.....	.....	.....	13,448	.....	.....	.....	.....	.....	13,448	13,448
Stowell Brothers	.....	340	.....	.....	340	4,310	1,000	126	5,501	28,396	28,736	28,736
Saudres	25,430	1,190	15,033	.....	59,853	10,528	.....	.....	.....	15,955	75,810	75,810
Exports from Para	91,574	55,010	372,188	51,317	791,088	706,445	18,569	5,063	11,741	741,271	1,533,336	1,533,336
Manaos	35,146	56,268	130,782	38,553	578,029	489,870	48,161	12,268	8,171	604,470	1,182,499	1,182,499
Iquitos	.....	.....	.....	.....	.....	54,071	2,665	6,665	14,331	77,732	77,732	77,732
Total, October, 1915	634,999	111,278	502,970	89,870	1,369,117	1,250,386	69,935	23,996	7,495	1,423,473	2,792,590	2,792,590
Total, September, 1915	1,322,999	220,730	582,698	136,838	2,463,265	451,037	28,155	32,280	20,840	532,312	2,973,577	2,973,577

EXPORTS OF INDIA RUBBER FROM MANAOS DURING OCTOBER, 1915.

	NEW YORK.					EUROPE.					GRAND TOTAL.
	Fine.	Medium.	Coarse.	Caucho.	TOTAL.	Fine.	Medium.	Coarse.	Caucho.	TOTAL.	
EXPORTERS.											
Suter & Co.,	49,520	3,171	17,627	12,750	83,068	69,630	7,425	32	10,350	87,437	170,505
General Rubber Co. of Brazil,	135,392	20,231	29,077	9,300	194,000	51,271	8,423	782	5,263	65,739	259,739
Padlow & Co.,	8,272	6,110	28,352	8,478	43,212	30,848	6,400	2,700	7,350	47,298	234,210
Adelbert H. Alden, Ltd.,	12,385	12,912	20,673	205	46,175	36,329	60	210	23,898	120,497	166,672
G. Fradelizi,	31,355	5,084	24,373	2,655	64,064	79,262	13,027	98	.....	92,387	156,451
Tancredo Porto & Co.,	20,640	8,160	9,840	5,168	43,748	10,343	5,728	.....	.....	16,071	139,684
Stonell & Sons, .....	.....	.....	.....	.....	.....	2,298	957	.....	4,587	35,249	35,249
H. Balding,	20,362	.....	.....	.....	20,362	6,486	.....	.....	.....	6,486	26,848
Th. Levy, Camille & Co., .....	.....	.....	.....	.....	.....	372	185	1,311	.....	2,103	2,103
Mesquita & Co., .....	.....	.....	.....	.....	.....	608	.....	394	36	1,038	1,038
Total, October, 1915,	354,426	56,268	130,782	38,553	579,029	480,870	48,161	12,268	54,171	604,470	1,182,490
Total, September, 1915,	680,083	79,965	121,728	192,781	1,074,557	540,071	2,665	6,665	14,331	77,732	1,317,066

CUSTOM HOUSE STATISTICS.

PORT OF BOSTON—SEPTEMBER, 1915.			PORT OF CLEVELAND—OCTOBER, 1915.			PORT OF PORT HURON—OCTOBER, 1915.		
Imports.	Pounds.	Value.	Imports.	Pounds.	Value.	Imports.	Pounds.	Value.
Gutta jelutong	60,507	\$2,513	India rubber, crude	712	\$600	Rubber scrap	41,441	\$5,702
Gutta percha	146,415	13,690	Rubber scrap	404	25			
India rubber	93,210	44,266	Total	1,116	\$625			
India rubber scrap	60,287	6,451						
Total	360,419	\$66,920						
Exports:								
India rubber, reclaimed	24,809	\$3,400						
PORT OF PHILADELPHIA—SEPTEMBER, 1915.								
Imports:								
Rubber scrap	93,375	\$6,706						
PORT OF SAN FRANCISCO—SEPTEMBER, 1915.								
Imports:								
India rubber	216	\$90						
PORT OF CHICAGO—OCTOBER, 1915.								
Imports:								
Rubber scrap	19,184	\$1,070						

IMPORTS AND EXPORTS OF RUBBER AND RUBBER MANUFACTURES AT THE PORT OF NEW YORK. IMPORTS.

Week ending—	India Rubber.		Rubber Waste.		Rubber Manufactures.		China	
	Packages.	Value.	Packages.	Value.	Packages.	Value.	Packages.	Value.
October 30, 1915,	17,146	\$1,461,724	324	\$4,633	26	\$3,176	522	\$30,491
November 6	41,373	3,257,088	118	4,950	25	2,054	182	9,538
November 13	11,759	1,010,767	108	5,380	19	2,155	145	7,263
November 20	16,599	1,281,235	96	1,295	78	8,021	77	72,463

In addition to the above the following was imported during the week ending November 20: Substitutes, 32 packages, value \$1,685.

EXPORTS—September 15 to October 15, 1915.

MANUFACTURES TO	Footwear.		Tires.		Insulated Wire and Cable.		Other mfgs. of India Rubber.		Fountain Pens.		Chemical Gum.		Reclaimed Rubber.		Scrap.	
	Boots.	Shoes.	Auto.	Other tires and mfgs. of.	Insulated Wire and Cable.	Other mfgs. of India Rubber.	Fountain Pens.	Chemical Gum.	Reclaimed Rubber.	Scrap.	Boots.	Shoes.	Auto.	Other tires and mfgs. of.	Insulated Wire and Cable.	Other mfgs. of India Rubber.
Africa	\$32,170	\$420	\$136	\$19,112	\$790	\$731	\$2,812	.....	.....	.....	.....	.....	.....	.....	.....	.....
Argentina	3,258	164	.....	17,646	3,878	17,137	9,028	.....	.....	.....	.....	.....	.....	.....	.....	.....
Australia .....	.....	.....	.....	13,880	11,029	31,453	1,800	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brazil	3,744	55	249	17,460	19,099	9,298	8,734	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bolivia	761	.....	.....	234	.....	3,813	2,335	.....	.....	.....	.....	.....	.....	.....	.....	.....
British Guiana .....	.....	.....	.....	1,431	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Canada	28	736	13,514	297	495	.....	253	.....	.....	.....	.....	.....	.....	.....	.....	.....
Central America and Panama	7,801	.....	353	37,632	2,586	.....	18,175	.....	4	3,079	.....	.....	.....	.....	.....	.....
Chile	9,496	6,647	.....	969	1,597	.....	1,597	.....	.....	.....	.....	.....	.....	.....	.....	.....
China .....	.....	.....	.....	.....	.....	.....	483	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colombia	926	.....	.....	1,745	1,441	.....	1,282	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dutch East Indies .....	.....	620	.....	3,280	277	.....	277	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ecuador .....	.....	.....	.....	309	478	.....	313	.....	.....	.....	.....	.....	.....	.....	.....	.....
France	3,043	35	1,401	599	55,714	.....	7,754	.....	.....	.....	.....	.....	.....	.....	.....	.....
French Guiana .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Great Britain	25,187	133,135	5,818	604,558	170,261	18,296	124,352	945	10,772	34,003	.....	.....	.....	.....	.....	.....
Greece .....	.....	.....	.....	190	.....	.....	48	.....	.....	.....	.....	.....	.....	.....	.....	.....
Holland .....	.....	.....	.....	1,203	1,900	.....	1,514	.....	.....	.....	.....	.....	.....	.....	.....	.....
India .....	.....	.....	.....	94	.....	.....	94	.....	.....	.....	.....	.....	.....	.....	.....	.....
Italy	613	.....	1,664	50,018	44,814	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Japan	3,629	.....	.....	57	.....	.....	3,882	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mexico	1,853	.....	.....	86	.....	.....	1,588	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Zealand	136	506	.....	3,329	413	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norway, Sweden and Denmark	372	.....	6,972	740	8,736	33,852	1,602	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oceania .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peru	4,083	477	.....	1,786	305	3,896	417	.....	.....	.....	.....	.....	.....	.....	.....	.....
Philippines	63	.....	2,170	265	5,386	.....	301	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portugal .....	.....	.....	.....	72	.....	.....	95	.....	.....	.....	.....	.....	.....	.....	.....	.....
Roumania .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Russia .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spain .....	.....	.....	.....	6,170	1,283	.....	573	.....	.....	.....	.....	.....	.....	.....	.....	.....
Straits Settlements .....	.....	.....	.....	520	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Uruguay	1,880	.....	.....	6,353	3,507	2,741	312	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yokohama .....	.....	.....	.....	1,094	261	1,603	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Indies	8,217	41	643	37,683	5,253	14,653	16,606	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	\$108,352	\$133,028	\$46,850	\$832,834	\$371,681	\$121,005	\$208,425	\$2,081	\$93,469	\$3,003	\$24,348	\$24,348	\$24,348	\$24,348	\$24,348	\$24,348

In addition to the above the following were exported during the same period: To Great Britain, aeroplanes, value \$28,080, and india rubber, value \$2,355; to Spain, aeroplanes, value \$37,980; to Brazil, india rubber, value \$720, and to Argentina, india rubber, value \$536.

THE RUBBER SCRAP MARKET.

A REVIEW of the rubber scrap market for the first week of November failed to disclose any particular feature of interest to the trade other than the firm tone that has persistently prevailed. The mills disclaimed any shortage in stocks, and buyers generally are apparently indifferent to attractive offers based on large deliveries. Inquiries for boots and shoes developed a surprisingly strong market and in several instances quotations of 9 cents delivered were made. The mechanical goods manufacturing were reported as active buyers and therefore matting, black scrap, and hose stocks developed firmer prices. The balance of the list appeared to be unattractive to buyers and prices remained practically unchanged.

Boots and shoes continued to be the leading feature during the second week, as far as prices were concerned, and mills were asked to pay 8½ to 8¾ cents delivered. The tire situation developed firmness, and sales of white tires were reported at 6½ cents to consumers and mixed auto tires in desirable lots were offered at 5¼ to 5½ cents.

As the month progressed, the tendency of the market to advance, with boots and shoes leading, was very evident. Large buyers were obliged to divide their orders to avoid the creation of higher levels; but in every instance unexpected strength and firm price were encountered.

Crude rubber prices advanced rapidly in the beginning of the third week, and by November 20 the active buying in London had advanced prices 15 cents a pound. This of course was reflected in the rubber scrap market and prices rose accordingly.

NEW YORK QUOTATIONS FOR CARLOAD LOTS DELIVERED.

November 29, 1915.

	Per Pound.
Trimmed and shoes.....	\$0.10 to \$0.10 1/2
Trimmed articles.....	.08 to .08 1/2
White tires, Goodrich and Goodyear.....	.07 1/2 to .07 3/4
Auto tires, standard white.....	.06 to .06 1/2
Auto tires, standard mixed.....	.05 1/2 to .05 3/4
stripped, unguaranteed.....	.03 1/2 to .04
Auto peeling, No. 1.....	.08 1/2 to .09
No. 2.....	.07 1/2 to .08
Inner tubes, No. 1.....	.27 to .28
No. 2.....	.11 1/2 to .12
red.....	.13 to .14
Irony tires.....	.02 1/2 to .03
Bicycle tires.....	.03 to .04
Solid tires.....	.05 to .05 1/2
White scrap, No. 1.....	.12 to .12 1/2
No. 2.....	.09 to .09 1/2
Red scrap, No. 1.....	.07 1/2 to .08
No. 2.....	.06 to .07
Mixed black scrap, No. 1.....	.04 1/2 to .05
No. 2.....	.03 to .04
Rubber car springs.....	.04 1/2 to .05
Horse shoe pads.....	.03 1/2 to .04
Matting and packings.....	.01 1/2 to .02
Four ten hose.....	.05 to .06
Air brake hose.....	.05 1/2 to .06
Cotton fire hose.....	.02 to .03
Large hose.....	.01 1/2 to .02
Hard rubber scrap, No. 1, bright fracture.....	.23 to .24
Batters and compound.....	.02 1/2 to .03
Insulated wire stamping.....	.03 to .04
Rubber combs.....	.03 1/2 to .04

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF RUBBER AND RUBBER MANUFACTURES.

Article.	September, 1915.		Nine Months Ending September, 1915.	
	Quantity.	Value.	Quantity.	Value.
Unmanufactured.....				
Balata.....	73,888	\$39,457	1,889,068	\$496,088
Castle gum.....	415,713	110,530	4,866,076	1,347,506
Gutta percha.....	4,156,271	158,321	15,785,099	748,869
Gutta percha.....	\$45,823	\$7,450	1,732,126	203,527
Total.....	5,251,050	\$355,758	23,937,972	\$2,895,990

Article.	September, 1915.		Nine Months Ending September, 1915.	
	Quantity.	Value.	Quantity.	Value.
India rubber, free, pounds.....				
From Eastern.....			220,032	\$100,742
Guatemala.....			76,882	26,843
Portugal.....	130,425	\$42,380	3,264,589	1,349,497
United Kingdom.....	5,337,332	3,095,592	69,719,983	\$7,997,760
Central Am. States and Brit. Honduras.....	106,994	48,857	971,942	\$37,801
Mexico.....	106,415	1,459,000	1,849,000	\$5,141,453
Brazil.....	4,581,341	1,647,791	38,172,743	16,165,002
Other South America.....	256,230	114,689	4,384,007	1,894,496
East Indies.....	8,938,271	4,819,260	36,709,657	19,190,659
Other countries.....	4,700	1,880	5,037,885	2,815,739
Total.....	19,671,360	\$9,846,576	160,416,636	\$73,993,994
Rubber scrap, free, pounds.....	1,286,356	98,951	8,807,171	613,164
Total unmanufactured.....	\$10,301,285		\$83,413,148	
Chicle.....durable, pounds.....	827,648	\$303,436	6,100,650	\$2,282,281
Manufactured.....				
Gutta percha.....durable.....		\$1,545		\$5,088
India rubber.....		15,990		1,406,396
Total manufactured.....		\$15,433		\$1,406,396
Substitutes, elasticon, etc., durable.....		\$48		\$13,124

EXPORTS DOMESTIC MERCHANDISE.

Scrap and old rubber, pounds.....	301,659	\$24,505	1,100,147	\$357,958
Reclaimed rubber.....	637,924	81,667	47,886,661	60,485
Belt, hose and packing.....		154,139		1,406,396
Rubber boots.....pairs.....	79,531	66,706	1,295,51	344,133
Rubber shoes.....	174,142	83,836	1,810,427	1,161,353
Automobile tires.....				
To England.....		\$930,328		\$4,101,320
Canada.....		124,343		817,463
Mexico.....		7,517		78,904
Cuba.....		31,954		219,609
Australia.....		\$2,341		304,006
Philippines.....		1,164		196,486
Other countries.....		253,987		1,123,743
Total.....		\$1,391,834		\$6,901,621
All other tires.....		\$288,126		\$1,246,492
Footwear parts.....		17,464		184,860
All other rubber manufactures.....		466,102		3,555,575
Total manufactures.....		\$2,568,487		\$15,698,683

EXPORTS OF FOREIGN MERCHANDISE.

Unmanufactured.....				
Balata.....pounds.....	45,487	\$19,079	770,592	\$302,557
Gutta percha.....			47,391	16,701
Gutta percha.....			10,128	19
Gutta percha.....			49,178	10
India rubber.....	301,222	130,959	3,589,319	1,798,193
Rubber scrap or refuse.....			3,483	373
Total unmanufactured.....		\$150,038		\$2,128,139
Chicle.....	37,374	\$8,696	448,734	\$149,202
Manufactured.....				
Gutta percha.....pounds.....		\$19		\$19
India rubber.....		2,706		6,892
Total.....		\$2,725		\$6,911
Substitutes, elasticon, etc.,.....				\$364

EXPORTS OF RUBBER GOODS TO NONCONTIGUOUS TERRITORIES OF THE UNITED STATES.

Alaska.....				
Belt, hose and packing.....		\$10,593		\$101,181
Boots and shoes.....pairs.....	9,385	24,239	48,963	147,385
All other rubber mfg.....		4,554		19,279
Total.....		\$39,386		\$267,845
Puerto Rico.....				
Belt, hose and packing.....		\$4,607		\$23,104
Automobile tires.....		37,719		223,633
All other tires.....		6,052		24,000
All other rubber mfg.....		6,457		48,450
Total.....		\$50,835		\$418,427

Philippine Islands.....				
Belt, hose and packing.....		\$1,716		\$40,616
Boots and shoes.....pairs.....	4,866	3,621	28,644	26,276
Footwear.....		9,586		26,071
All other rubber mfg.....		5,208		98,811
Total.....		\$30,131		\$431,774

Hawaii.....				
Belt, hose and packing.....		\$7,179		\$45,260
Automobile tires.....		32,416		316,197
All other tires.....		3,400		39,864
All other rubber mfg.....		5,511		45,935
Total.....		\$48,606		\$426,056

UNITED KINGDOM RUBBER STATISTICS FOR
MONTH ENDING OCTOBER 31, 1915.

				August, 1915.		Five Months Ending August, 1915.	
IMPORTS.				Quantity.	Value.	Quantity.	Value.
Unmanufactured.							
Crude Rubber:							
From Dutch East Indies, <i>pounds</i> :							
French West Africa.....	52,600	\$295,998	5,068,900	\$2,707,832			
Gold Coast.....	160,000	95,989	1,188,000	513,828			
Other countries in Africa.....	69,000	19,333	539,800	162,596			
India.....	884,800	246,018	4,933,600	2,022,790			
Brazil.....	50,600	27,488	1,459,500	741,033			
Lat. Am. countries.....	3,100,900	1,553,952	24,362,000	13,169,438			
British India.....	208,400	115,046	2,493,200	1,307,797			
Straits Settlements, including Labuan.....	5,211,700	2,906,551	56,342,500	29,842,586			
Federated Malay States.....	3,550,200	2,006,412	24,478,500	13,509,561			
Ceylon and dependencies.....	2,219,800	1,218,212	24,675,400	13,128,469			
Other countries.....	274,900	156,648	3,538,900	1,721,864			
Total.....	15,959,900	\$8,613,652	149,075,200	\$78,827,794			
Waste and reclaimed rubber.....	484,300	\$39,852	3,360,500	\$377,437			
Gutta percha.....	389,000	173,502	6,096,800	2,577,812			
Manufactured:							
Apparel, waterproofed.....		\$1,783		\$22,687			
Boots and shoes—dozen pairs.....	30,204	284,432	120,420	918,516			
Insulated wire.....		88,765		442,306			
Submarine cables.....				637			
Automobile tires and tubes.....		1,397,124		6,875,185			
Motorcycle tires and tubes.....		37,887		473,637			
Cycle tires and tubes.....		10,750		202,715			
Tires not specified.....		4,529		84,243			
EXPORTS.							
Apparel, waterproofed:							
To France.....		\$23,586		\$146,962			
British South Africa.....		11,975		176,287			
British East Indies.....		1,882		117,597			
Australia.....		7,844		192,306			
New Zealand.....		51,13		119,449			
Canada.....		13,555		412,944			
Other countries.....		96,860		1,122,330			
Total.....		\$160,765		\$2,187,835			
Boots and shoes—dozen pairs.....		449,922		\$507,083			
Insulated wire.....		125,626		1,259,158			
Submarine cables.....		175,568		1,725,898			
Automobile tires and tubes.....		230,135		2,677,218			
Motorcycle tires and tubes.....		34,403		318,835			
Cycle tires and tubes.....		152,487		1,637,922			
Tires not specified.....		46,573		444,797			
Manufactures not specified.....		524,403		4,167,740			
EXPORTS, FOREIGN AND COLONIAL.							
Unmanufactured:							
To Russia..... <i>pounds</i>	1,302,600	\$670,320	19,252,400	\$10,297,849			
France.....	1,346,400	759,764	12,842,300	7,215,045			
United States.....	5,179,400	2,944,125	73,102,900	39,311,947			
Other countries.....	1,074,600	609,269	15,008,700	8,265,691			
Total.....	8,903,000	\$4,983,478	120,206,300	\$65,088,532			
Waste and reclaimed, <i>pounds</i>	29,600	\$3,718	608,300	\$92,462			
Gutta percha.....	32,300	16,364	723,600	322,291			
Manufactured:							
Apparel, waterproofed.....		\$180		\$23,438			
Boots and shoes—dozen pairs.....	112	1,166	6,969	50,956			
Insulated wire.....		1,750		9,724			
Automobile tires and tubes.....		182,634		2,306,744			
Motorcycle tires and tubes.....		2,236		59,220			
Cycle tires and tubes.....		2,109		105,053			
Tires not specified.....				28,761			
* Included in "Rubber" prior to 1915. After 1914 "Rubber" is separated into "Raw" and "Waste and reclaimed."							

RUBBER STATISTICS FOR CANADA.

IMPORTS OF RUBBER AND MANUFACTURES OF.

				August, 1915.		Five Months Ending August, 1915.	
UNMANUFACTURED, FREE.				Quantity.	Value.	Quantity.	Value.
Rubber and gutta percha, crude caoutchouc or india rubber:							
From Great Britain.....	168,883	\$95,287	1,350,884	\$758,306			
United States.....	355,941	190,604	1,535,432	759,642			
B. Straits Settlements.....			11,200	546			
Other countries.....			169,898	79,492			
Total.....	524,824	\$285,891	3,067,414	\$1,602,786			
Rubber, recovered:							
From Great Britain.....			4,392	\$2,482			
United States.....	456,803	\$5,457	1,915,208	240,036			
Total.....	456,803	\$5,457	1,919,600	\$242,518			

				August, 1915.		Five Months Ending August, 1915.	
Rubber substitutes:				Quantity.	Value.	Quantity.	Value.
From Great Britain.....						10,820	\$1,166
United States.....				37,455	\$2,316	191,525	13,965
Total.....				37,455	\$2,316	202,345	\$15,131
Rubber, powdered, and rubber in gutta percha waste or junk:							
From Great Britain.....				2,709	\$217	7,506	\$217
United States.....				115,096	\$4,612	408,136	30,615
Other countries.....						3,539	1108
Total.....				117,805	\$4,829	419,154	\$31,047
Rubber thread, not covered:							
From United States.....				1,859	\$2,583	16,484	\$14,512
Hard Rubber, in sheets and rods:							
From United States.....				418	\$355	35,085	\$3,738
Balata, crude:							
From United States.....						1,333	\$820
Cicle, crude:							
From Great Britain.....				2,888	\$1,675	2,888	\$1,675
United States.....				57,717	21,846	150,702	63,247
British Honduras.....						509,300	184,233
Mexico.....						126,294	46,238
Total.....				60,605	\$23,521	768,184	\$295,583
MANUFACTURED, DOMESTIC.							
Waterproof clothing:							
From Great Britain.....				\$667	\$32,305	\$4,478	\$211,116
United States.....				10,337		58,622	
Other countries.....						27	
Total.....				\$11,004	\$32,305	\$61,127	\$211,116
Hose, lined with rubber:							
From Great Britain.....					\$0		\$389
United States.....				\$3,748		\$32,523	
Total.....				\$3,748	\$0	\$32,523	\$389
Mats and Matting:							
From Great Britain.....							\$84
United States.....				\$195		\$641	
Total.....				\$195		\$641	\$84
Packings:							
From Great Britain.....					\$3.4	\$0	\$817
United States.....				\$4,892		\$42	
Total.....				\$4,892	\$3.4	\$22,495	\$817
Tires of rubber for all vehicles:							
From Great Britain.....				\$2,255	\$2,207	\$8,842	\$14,208
United States.....				120,500		512,608	
France.....				608		12,458	
Other countries.....				195		954	
Total.....				\$123,558	\$2,207	\$534,862	\$14,208
* Rubber cement, and all manufactures of india rubber and gutta percha, N. O. P.:							
From Great Britain.....				\$223	\$9,681	\$1,313	\$84,470
United States.....				39,288		231,538	
Other countries.....				9,724		37	
Total.....				\$39,511	\$9,681	\$233,178	\$84,470
Hard rubber, unfinished, in tubes, for manufacture of fountain pens:							
From United States.....						\$1,941	
Webbing, elastic, over one inch wide:							
From Great Britain.....					\$883		\$5,004
United States.....				\$12,141		\$53,608	
Other countries.....				338		930	
Total.....				\$12,670	\$883	\$54,028	\$5,004
Boots and Shoes:							
From Great Britain.....				\$7,023	\$6,733	\$26,050	\$10,400
United States.....				10		30	
Other countries.....							
Total.....				\$7,083	\$6,733	\$26,060	\$10,400
Belting:							
From Great Britain.....							\$1,041
United States.....				\$6,490		\$20,875	
Total.....				\$6,490		\$22,812	\$1,041
* In addition, the imports of rubber cement and all manufactures of india rubber and gutta percha amounted to \$342 during August, and \$933 for the five months ending August, these values being at treaty rates.							

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS

MANUFACTURER, DECEMBER	August, 1915.		Five months ending August, 1915.	
	Prod. of Canada.	Re-exports use of foreign goods.	Prod. of Canada.	Re-exports use of foreign goods.
	Value.	Value.	Value.	Value.
Belting				
To United States				\$35
Newfoundland			\$24	
Hose:				
To Great Britain	\$143		\$4,139	
United States	23	\$70	3,122	\$117
Newfoundland	98		915	
Other countries	477		1,249	
Total	\$261	\$70	\$10,525	\$117
Boots and Shoes:				
To Great Britain	\$2,206		\$3,738	
United States	207	\$117	3,510	\$435
Newfoundland	1,417		904	
Australia	79		4,887	
Other countries	686		8,227	
Total	\$5,199	\$117	\$21,751	\$435
Mats and Mattings.				
To various countries			\$418	
Clothing:				
To Great Britain			\$37	
United States	\$10	\$172	39	\$102
Newfoundland			140	
Other countries			11	
Total	\$10	\$172	\$217	\$202
*Rubber waste:				
To United States	\$75,855		\$264,708	\$1,624
All other, N. O. P.:				
To Great Britain	\$67,696	\$1,418	\$343,962	\$1,954
United States	13,711	5,292	64,286	259,715
Newfoundland	271		3,195	
Australia	1,012		964	
Other countries	3,930		21,927	10
Total	\$86,666	\$6,710	\$336,334	\$261,679
†Gum Chicle:				
To Great Britain			\$5,000	
United States	\$52,746	\$2,118	263,810	\$61,593
Other countries	29,673		39,076	1,107
Total	\$82,419	\$2,118	\$307,886	\$62,700

*For the month of August the total amount, by weight, of exported rubber waste was 1,350,000 pounds, and for the five months ending August was 4,265,800. (In our November issue the amount exported during the four months ending July should have been 2,915,800 pounds.)

†For the month of August the total amount, by weight, of exported chicle was 146,774 pounds, and for the five months ending August was 760,000 pounds.

CANADIAN IMPORTS AND EXPORTS OF RUBBER FOR THE YEAR ENDED MARCH 31, 1915.

UNMANUFACTURED, FREE	Imports.		Exports.	
	Pounds.	Value.	Pounds.	Value.
Crude rubber and gutta percha:				
From Great Britain	1,912,743	\$1,048,211		
British India	114,111	73,195		
British East Indies	290,637	155,092		
Brit. Straits Settlements	1,422,513	718,401		
Belgium	61,627	26,867		
France	2,265	1,101		
Germany	36,200	15,139		
Congo Free State	35,486			
United States	3,594,470	2,041,605		
British Oceania	11,860	7,709		
Total	7,481,962	\$4,100,272		
Rubber and gutta percha waste:				
From Great Britain	109	\$24		
Newfoundland	14,766	495		
Miquelon and St. Pierre	600	24		
United States	642,885	83,407	4,235,610	\$278,442
Total	658,351	\$83,951	4,235,610	\$278,442
Balata, crude:				
From Great Britain	10	\$16		
United States	374	288		
Total	384	\$304		
Chicle, crude:				
From Great Britain			20,000	\$9,750
Australia			5,823	3,278
British Honduras	1,631,440	\$552,450		
France	32,670	11,744		
Mexico	2,923,493	989,958		
Venezuela	54,818	18,637		
United States	1,261,450	418,128	2,095,142	1,069,748
Total	5,963,911	\$1,999,912	2,115,165	\$1,083,526

MANUFACTURED, FREE	Exports.	
	Amount.	Value.
Rubber (total, unmanufactured)		
From United States	\$1,624	\$6,217
MANUFACTURED, FREE		
Boots and Shoes:		
From Great Britain		\$26,044
Japan		57
United States		4
Australia		72
Belgium		60
British East Indies		585
British Oceania		76
Trin. Island		62,469
Newfoundland		23,572
New Zealand		47
Alaska		1
Dutch West Indies		1
France		2,088
Miquelon and St. Pierre		
Norway		
Total		\$68,815
Belting		
From Great Britain		\$8,727
Newfoundland		88
Alaska		34
Brazil		77
United States		17,744
Total		\$82,065
Waterproofed apparel:		
From Great Britain		\$2,408
Newfoundland		76
Hong Kong		14
Austria-Hungary		60
Germany		208
Japan		3
United States		51
Belgium		25
Total		\$2,978
Rubber Hose:		
From Great Britain		\$3,400
Belgium		8
British South Africa		12
British West Indies		73
Newfoundland		76
New Zealand		95
Miquelon and St. Pierre		8
United States		8,000
Total		\$19,248
Packing, mats and mattings:		
From Great Britain		\$3,096
Germany		8
United States		66,510
Newfoundland		824
Total		\$69,664
Tires for all vehicles:		
From Great Britain		\$44,953
Belgium		2,191
France		47,643
Germany		13,109
Holland		230
Italy		3,283
Russia		43,086
United States		1,044,592
Total		\$1,199,077
Hand Rubber for fountain pens:		
From United States		\$5,957
Elastic fabric:		
From Great Britain		\$11,794
France		241
Germany		535
Switzerland		404
United States		19,983
Total		\$13,117
Rubber cement, and all manufactures of india rubber and gutta percha, N. O. P.		
From Great Britain		\$225,023
Newfoundland		2
Austria-Hungary		3,425
Belgium		1,325
France		4,317
Germany		24,226
Holland		25
Italy		8
Japan		8
Russia		14
Sweden		14
Switzerland		6,966
United States		6,966
Total		\$278,126

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

TRADE in heavy chemicals and pigments and fillers has been very active during November, accompanied by a distinct rise in prices, week by week, in certain important lines, notably in lead pigments and caustic soda.

Pig lead was in strong demand at the beginning of the month at 5 cents per pound, due largely to export buying. With foreign markets holding at high levels there is small prospect of a decline in the American market. Exports of white lead have been unusually heavy this year. The official figures for last August were 2,161,680 pounds. This is practically double the amount exported in August, 1914. On the basis of the white lead exports for eight months, ending with August, 1913, the increase for the same periods in 1914 and 1915 were, respectively, 16½ per cent, and 52 per cent. These figures sufficiently explain the steady rise of one quarter cent per pound per week which has taken place in each of the lead products in common use by rubber manufacturers.

In the case of caustic soda the market is unusually strong, due to shortage of caustic soda in the face of actual demand. The contract price of caustic soda has advanced fully one cent per pound during November.

Acetic acid has advanced about three quarters of a cent per pound for 28 per cent, owing to the influence of a corresponding rise in acetate of lime. Glacial acid has risen from 25 cents to 35 cents per pound. Sulphuric acid is limited in supply and the price for 66° advanced early in the month about three quarters of a cent per pound. This level has been maintained.

Domestic zinc oxide has risen somewhat since our last report. Contracts for green, red and white seal French zinc oxides are offered for delivery during the first three months of 1916 at about double the present prices of domestic zinc oxide.

Aniline contracts are quoted at 60 cents per pound. A few large users in the rubber industry are equipped with aniline manufacturing plants and others are being erected.

The market on solvents is firm, with a tendency to advance.

PRICES OF CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK, NOVEMBER 29, 1915.

Subject to change without notice.

Acetone, (drums)	lb.	\$0.30½ @ \$0.35
Acid, acetic, 28 per cent, (bbls.)	lb.	.03½ @ .05
glacial, 99% (carboys)	lb.	.30 @ .35
Aluminum Flake (carloads)	ton	18.00 @ 20.00
Ammonium carbonate		None
Antimony, crimson, sulphuret of (casks)	lb.	.80 @ .85
golden, sulphuret of (casks)	lb.	.65 @ .70
Asbestos	ton	19.00 @ 20.00
Asphaltum "42" Brilliant	lb.	.04 @ .05
"43"	lb.	.03 @ .03½
Barium sulphate, precipitated	ton	12.00 @ 14
Barytes, pure white	ton	18.50 @ 21.00
off color	ton	17.50 @
Basefor	ton	115.00 @
Benzoil, pure	gal.	.90 @ 1.00
Beta-Naphthol	lb.	2.00 @
Black Hypo	lb.	None
Black Flake	lb.	.01 @ .03½
Bone ash	lb.	.04 @
black	lb.	.06½ @ .07
Cadmium tri-sulphate		None
yellow		None
Cantella gum	lb.	.27½ @ .35
Carbon, bisulphide (drums)	ton	.06½ @ .07½
black (casks)	ton	.07½ @
tetrachloride (drums)	lb.	.18 @
Caustic soda, 76 per cent (bbls.)	cwt	5.00 @ 5.50
Chalk, precipitated, extra light	lb.	.04 @ .04½
China clay, domestic	ton	12.50 @ 13.50
imported	ton	19.00 @ 24.00
Chrome, green	lb.	.08 @ .10
yellow	lb.	.13 @ .14½
Cotton linters	lb.	.06½ @ .08
Empress	ton	70.00 @
Gas black	lb.	.07½ @
Gilsonite	ton	37.50 @ 42.50
Glycerine, C. P., (drums)	ton	.60 @ .65

Graphite, flake (250 to 400 pound bbl.)	lb.	.17½ @
powdered (250 to 400 pound bbl.)	lb.	.17½ @
Green oxide of chromium (casks)	lb.	.30 @ .35
Ground glass	lb.	.02½ @
Iron oxide, red, reduced grades	lb.	.02 @ .05
red, pure	lb.	.05 @ .08½
Infusorial earth, powdered	ton	50.00 @
bolted	ton	60.00 @
Ivory, black	lb.	.08 @ .12
Indian red	lb.	.02½ @ .05½
Lampblack	lb.	.04 @ .08
Lead, red oxide of	lb.	.06½ @ .06¾
sublimed	lb.	.06 @ .05¾
white, basic carbonate	lb.	.05½ @ .06
white, basic sulphate	lb.	.05½ @ .05¾
Lime, flour	lb.	.01 @ .01½
Li tharge	lb.	.06½ @ .06¾
English	lb.	.05 @
Lithopone, domestic	lb.	.07½ @ .08
Imported	lb.	.08½ @ .09
Magnesia, carbonate	lb.	.05½ @
calcined, heavy	lb.	.11 @
light	lb.	.05 @ .27½
Magnetite, calcined, powdered	ton	35.00 @ 40.00
Mica, powdered	lb.	.03½ @ .05
Mineral rober	lb.	.01¾ @ .04½
Naphtha, stove gasoline (steel bbls.)	gal.	.19 @
66 to 68 degrees	gal.	.23 @
68 to 70 degrees	gal.	.24 @
Oil, aniline	lb.	1.10 @ 1.40
linseed (bbls.)	gal.	.63 @ .65
palm	gal.	.08 @ .08½
pine (casks)	gal.	.60 @
rapeseed	gal.	.85 @ .88
rosin, heavy body	gal.	.28 @ .40
tar (casks)	gal.	.23 @
soluble aniline colors, yellow, orange, red, violet, blue, green	lb.	2.50 @
Orange mineral, domestic	lb.	.08½ @ .09½
Petroleum grease	lb.	.05 @ .06
Pine tar, retort	lb.	.14 @ .18
Pitch, burgundy	lb.	.04 @ .05
pure	lb.	1.95 @
Plaster of paris	lb.	1.50 @ 1.70
Prussian blue	lb.	1.50 @
Pumice stone, powdered (bbls.)	lb.	.02 @ .03
Resin, Pontianak, refined		None
granulated		None
fused		None
Rosin (500 pound bbls.)	lb.	4.50 @ 8.00
Rotten stone, powdered	lb.	.02½ @ .04
Rubber black	lb.	.02 @ .02½
Rubber substitute, black	lb.	.06 @ .07½
"white"	lb.	.07½ @ .15
Shellac, fine orange	lb.	.22 @ .25
Soapstone, powdered	ton	10.00 @ 12.00
Starch, corn, powdered	lb.	.02 @
Sulphur chloride (drums)	lb.	.07 @
Sulphur, flowers	cwt.	2.20 @ 2.60
Sulphuric acid, 66°	lb.	.01¾ @ .02½
Talc, American	ton	8.50 @ 13.00
French	ton	18.00 @ 25.00
Toluol, pure	gal.	4.50 @ 5.00
Triplite earth, powdered	ton	50.00 @
bolted	ton	60.00 @
Turpentine, pure gum spirits	gal.	.56 @ .59
wood	gal.	.42 @ .49
Ultramarine, blue	lb.	.05 @ .22
Vermilion, brilliant	lb.	.75 @ .80
Chinese	lb.	.95 @ 1.00
English	lb.	1.75 @
Wax, bayberry	lb.	.22 @ .24
bereswax, white	lb.	.15 @ .16
ceresin, white	lb.	.14 @ .16
carnauba	lb.	.23 @ .40
ozokerite, black	lb.	.45 @
green	lb.	.65 @
montan	lb.	.27 @ .30
paraffin, refined	lb.	.04½ @
133 125 m. p. (casks)	lb.	.04½ @
128 130 m. p. (casks)	lb.	.05½ @
133 136 m. p. (casks)	lb.	.06 @ .06½
crude, white, 117/119 m. p. (bbls.)	lb.	.03½ @
yellow, 124 126 m. p. (bbls.)	lb.	.03½ @
Whiting, Alba, factory	ton	6.50 @ 7.50
commercial	cwt.	.50 @ .60
gliders	cwt.	.60 @ .70
Paris white, American	cwt.	.75 @ .85
English cliffstone	cwt.	.90 @ 1.25
Wood pulp, XXX	lb.	28.00 @ 35.00
Yellow ochre	lb.	.01¾ @ .02
Zinc oxide, American process (factory) horse head, "special"	lb.	.09½ @ .09¾
"XXX red"	lb.	.08½ @ .08¾
French process, green seal	lb.	.16½ @ .16¾
red seal	lb.	.16 @ .16½
white seal	lb.	.17 @ .17½
Zinc sulphide	lb.	.07½ @

MARKET FOR COTTON AND OTHER FABRICS.

THE ASSOCIATED market has been most active and all grades of cotton fabrics used by the rubber mills were in demand. It is now evident that instead of laying in stocks at the usual time, buyers have been waiting for easier market conditions and better prices. The appearance of heavy buying orders covering all grades of cotton fabric indicate that the mills are now replenishing their depleted stocks. The principal condition in these orders that cover all grades of fabrics used by the rubber manufacturers from sheeting to tire fabrics, is that of delivery.

STOCKINETTES

The cotton stockinette situation shows evidence of heavy foreign buying and the market has been stripped of the cheaper grades. The mills refuse to take orders for anything less than 50 cents, preferring to run the looms on more profitable and better grades. The scarcity of colors has already been felt and in consequence blue and red stockinettes are selling at advanced prices. The volume of domestic business is large and mills are well sold ahead.

Wool stockinette has not been greatly affected by foreign buying; however, domestic business is good and deliveries are being promptly called for. The fact that raw cotton, wool and dyes have advanced would indicate higher, rather than lower prices for stockinettes.

TIRE FABRICS

The demand for tire fabrics has continued unabated during the past month and as a matter of fact manufacturers have been most urgent in their calls for deliveries. The increased business in tires that will follow the rapidly expanding production of automobiles is doubtless a factor in the steady demand. Reserve stocks were being bought in anticipation of this new business and also to meet the requirements of increased factory production.

HOSE AND BELTING DUCK

The heavy grades of hose and belting duck were in good demand and steady buying for foreign as well as domestic account continues, particularly the latter. The railroads have commenced buying large supplies of air brake hose for both old and new equipment and are likely to take a large part of the available hose and belting duck for the next six months. Hose duck has advanced to 25 cents and belting duck is now quoted at 24 cents.

SHEETINGS

Sheetings have advanced and no spot lots were to be had—wide grades, in particular, have been sold into next year.

CARRIAGE CLOTH DUCK

Carriage and enameling duck have been practically sold up and there are no spot stocks to be had. The cause is the production of automobiles, that continues to increase steadily. Large quantities of this particular grade of duck are also used for tops and cushions in the carriage trade, which is noticeably improving. Despite the steady demand prices have not changed.

YARN DYED GOODS

Yarn dyed imported goods have been bought very largely for 1916. Foreign mills are not accepting new accounts and are refusing business unless contracts are written for deliveries in June, 1916, and later. Domestic mills are practically sold up to deliveries in May, 1916. Trade has been active and prices are firm with a tendency toward higher levels. The scarcity of dyes has directed the attention of manufacturers to the better grade of goods.

For the fiscal year ending March 31, 1915, Canada imported from the United States, stockinette for the manufacture of rubber boots and shoes, value \$54,174, and from the United Kingdom, stockinette, value \$21,945. For the same period, seamless cotton or linen duck for hose was imported from the United States, value \$71,635, and from Great Britain, value \$2,790.

The following are New York quotations on November 24, 1915:

Wamsutter, S. A. I. L. No. 1, 40-inch.....	yard	\$0.22	@
Wamsutter, S. A. I. L. No. 2, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 3, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 4, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 5, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 6, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 7, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 8, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 9, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 10, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 11, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 12, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 13, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 14, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 15, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 16, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 17, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 18, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 19, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 20, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 21, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 22, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 23, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 24, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 25, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 26, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 27, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 28, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 29, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 30, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 31, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 32, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 33, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 34, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 35, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 36, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 37, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 38, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 39, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 40, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 41, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 42, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 43, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 44, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 45, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 46, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 47, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 48, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 49, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 50, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 51, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 52, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 53, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 54, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 55, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 56, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 57, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 58, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 59, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 60, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 61, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 62, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 63, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 64, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 65, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 66, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 67, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 68, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 69, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 70, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 71, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 72, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 73, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 74, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 75, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 76, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 77, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 78, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 79, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 80, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 81, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 82, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 83, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 84, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 85, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 86, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 87, 40-inch.....	yard	11	@
Wamsutter, S. A. I. L. No. 88, 40-inch.....	yard	11	@
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CANADIAN IMPORTS OF COTTON FABRICS.

Articles, Durable.	August, 1915.		Five Months Ending August, 1915.	
	General Tariff.	Preferential Tariff.	General Tariff.	Preferential Tariff.
Articles, Durable.	Value.	Value.	Value.	Value.
Stockinette for the manufacture of boots and shoes.				
From Great Britain		\$40	\$102,150	\$10,900
United States	\$21,998		11	
Other countries	2,790			



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GUAYULE BOOM NOT LIKELY.

The newspaper reports that the guayule industry is on the verge of the greatest boom in its history cannot be verified. We have learned from an authoritative source that no new concerns are entering the guayule business in Mexico at the present time and that the rush for leases of guayule lands is without foundation in fact. It is true, however, that, due to the war, certain titles to large tracts of guayule land claimed by the Mexicans have been questioned. Until such titles are shown to be clear, particularly those held by the "cientificos," operating would be out of the question.

The companies already in the field are preparing to resume operations, despite the adverse conditions that prevail in certain districts. For some years past, the Mexican guayule business has not been an attractive one financially, but the producers now have hopes that they will be permitted to operate without interruption and with ultimate success.

The adoption by the government of Cuba of a new form of consular invoice is now under consideration. It would, if adopted, require the shipper to furnish accurate information as to the component parts of the merchandise; for instance, in a shipment of tires, the percentage of rubber, fabric, etc., in each tire. It is recommended that manufacturers interested communicate with the Department of State at Washington, D. C., protesting against such an unreasonable customs regulation.

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 ip you with them.

RICK J. MAYWALD, F.C.S.
 CONSULTING CHEMIST
 'Phone, 823 John New York

BUYERS' DIRECTORY
 PAGE 73

HARRY M. HOPE
 ENGINEER
 141 MILK STREET
 Rubber Mill Engineering a Specialty
 INVESTIGATIONS
 REPORTS
 APPRAISALS
 DESIGNER
 SUPERVISION
 STEAM POWER PLANTS ELECTRICAL DISTRIBUTION
 BOSTON

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TABLE OF CONTENTS ON LAST PAGE OF READING.**THE SEASON'S GREETINGS.**

TO our friends at home: A happy and prosperous New Year.

To our friends at the European war front, of whatever nation: May this year, begun in battle and blood, attended by sufferings untold and calamities inconceivable, end in peace. May a greater freedom, a broader humanity and a lasting concord be the world's inheritance through succeeding years.

DOING WITHOUT DYES.

THE wonderful adaptability of the rubber trade to unusual conditions has often been remarked. Fresh emphasis is laid upon it at the present time in the substitution of colors, as black for white, in such products as motor tires, for example.

That is not difficult and is in the line of accepted practice. That such substitution should be carried into the field of colored fabrics is, however, novel and opens up a wide and profitable field. Such a problem was successfully met by a rubber company making carriage cloth.

Their product, normally, should be pebbled black rubber on one side and black uncoated fabric on the other, an effect that the customer desired. As no black cloth was to be had, the manufacturer used white, spreading the pebbled side, as usual, and skim-coating the other with a dull black rubber. The result was even more satisfactory than the usual type and bids fair to become the usual thing. If dye shortages and embargoes persist it is possible that similar substitutions will occur in many lines where colored fabrics are used. The possibility of the colored rubber surface, and perhaps a revival of the cemented, flocked surface, is not at all remote.

HIGHER PRICES, AND WHEN?

THE fact that rubber has already reached the dollar figure, combined with the higher cost of fabrics and compounding ingredients, certainly point toward higher prices in finished goods. The smaller manufacturers are apparently most anxious for the change, for as a class they are burdened with a heavier overhead, and owing to more limited capital cannot anticipate their requirements in rubber and materials as far in advance as do the larger interests.

That there is a feeling of unrest is evidenced by the opinions expressed in the trade. Many manufacturers do not hesitate to state that, at present prices, they are not seeking orders with their accustomed diligence. Orders for future deliveries at current prices, it is said, are not desirable, and one case may be cited where an order from a distributor amounting to \$10,000, for 1916 delivery on the basis of recent prices, was turned down. The tendency of the market may also be observed from the fact that certain manufacturers have reduced discounts to dealers and a few have slightly advanced prices.

It is interesting to note that with the present keen competition, all manufacturers are compelled to observe uniform trading practices to guard the interests of their customers. There seems to be a consensus of opinion that should some of the prominent manufacturers advance prices, the example thus set would be universally followed. If any held out, their lower prices would attract orders that would soon exhaust their stocks and they would then be unable to take care of their regular trade, which would be forced into other channels and alienated. On the other hand, it has been suggested as not impossible that large concerns with plentiful supplies purchased when prices were below those now current, may hold off for three or four months. While it may be said that manufacturers' representatives and dealers are looking for an advance sooner or later, realizing that present costs will demand some action, there appears to be a wide difference of opinion as to the probable date of such change, however, in some quarters the guess is hazarded that it will come early in January.

The prevalent opinion is that the advance in tires will probably be one of 25 per cent, although some expect a 15 per cent rise at an early date, to be followed by an additional 10 per cent later. An increase of 15 per cent in the price of mechanical rubber goods is generally expected.

Glancing back but a few years in the tire industry, it will be recalled that the regular practice was to produce tires by hand. Gradually machinery, replacing manual labor, reduced the cost of manufacture. This, combined with greater factory efficiency, largely increased production, the lower cost of rubber, and keen competition, have served in securing repeated price reductions to distributors and dealers.

The repeated reductions in the past were justified by the conditions, and now the indications are that the rapidly increasing material cost will force manufacturers to adopt a higher selling price standard.

WITH CHARITY FOR NONE AND WELFARE FOR ALL.

THE welfare of the worker, the rubber worker, to be specific, has been on the conscience of the rubber employer, to a degree, from the beginnings of the industry, since, shall we say, 1828. For years acknowledgments of such responsibility took the form of turkeys at Thanksgiving or Christmas, with sporadic remembrances to those who in the fallible judgment of the boss appeared worthy. In the shop and out, the workers were almost wholly the architects of their own fortunes, and to their credit, be it said, they built uncommonly well.

The enormous growth of the rubber trade, the broadening of its outlook, a definite formulation of the rules that govern efficiency, however, resulted in organized welfare work. Nor was this confined to any one division of the industry. It developed coincidentally in the great tire, footwear, insulated wire, clothing, hard rubber and druggists' sundries factories. In each line, and indeed in each factory, the work took on its own individuality, and in all the results were an appreciable betterment. This improvement, be it noted, was not confined to the mental, moral or physical condition of the worker alone, but extended to the work both in quantity and quality.

The patent needs of rubber-working communities are model houses, hospitals, garden plots, ball fields, casinos, club houses, special reading courses, lectures—all of which are excellent and are in use today. But they have to do with the welfare during the hours of relaxation only, and efficiency demands more. It provides for the workers' welfare in the factory and during working hours, and outside as well. Thus safety, light, ventilation, are all made as nearly perfect as may be. Dust, because it clogs the human machine and renders it less efficient, is

"vacuumed" away. Glaring lights, because they produce eyestrain, which results in damaged work, are shaded, or walls are tinted, and, when necessary, goggles are supplied, and so on in infinite detail. In the big plants there are also physicians and nurses in attendance who quarantine all who have infectious troubles, from colds to small-pox, render first aid in scores of cases, and do preventive work without end.

"A wonderful charity," say you?

"Charity"—not a bit of it. Efficiency, not charity, is the basis of this work. The human machine is kept clean, sober, amused, interested, because thus it is the best producer. The extra goods produced pay for all these items many times over. Rubber manufacturers do not offer, nor do their help desire, charity. Today's motto is, "With charity for none and welfare for all."

COMMERCIAL SYNTHETIC RUBBER.

THE news comes from Germany—is even affirmed by the German Chancellor in a speech before the Reichstag—of the use of synthetic rubber in lieu of the natural product. The statement is undoubtedly true. At the same time it is probably of no importance to those interested in rubber outside of the countries controlled by the Germanic allies. Before the war synthetic rubber in ton lots was made in Germany. It cost so much, however, that it could not compete in price with either the wild or the plantation product. At the present time, because of the rubber famine in Germany, the price of plantation crêpe is between \$10 and \$12 a pound. At such figures synthetic rubber can be profitably produced. With rubber at 86 cents, however, and no famine, synthetic rubber would still be commercially impracticable. The rubber planter may, therefore, rest secure on a product that costs from one to two shillings, as against one that costs several dollars a pound. The fact that Germany is actually making and using synthetic rubber will, of course, startle some readers. It is for their comfort, therefore, that the foregoing is written. As to further reassurance, there is the fact that the German Colonial Association, in a recent resolution, laid emphasis on the future need to the Fatherland of colonies in which could be grown rubber and gutta percha. They advise plantations, not laboratories. The inference would seem to be sufficiently plain.

UNUSUAL INTEREST ATTACHES TO THE DECISION OF Judge Lacombe, of the United States Circuit Court of Appeals in which he upholds the validity of the Marks patent on the alkali process for reclaiming rubber. Based as it is on a common sense review of the inventor's claims, the decision ranks in importance, as regards the rubber manufacturing industry, second only to the famous decision by which the Goodyear patents were confirmed to the inventor.

Standard Tire Fabrics.

It is not an exaggeration to say that the automobile tire has demanded quite as much thought, inventive skill and scientific development as any other part of the modern motor car. The tire is not a mere cushion, with the road on one side and the wheel with its burden on the other. It is not a passive medium of translation even when placed upon a forward wheel, and when attached to the rear axle its service is virtually that of a prime mover.

Its stresses and strains are many. When driving straight ahead, the blows delivered to the tire differ in magnitude according to the size and nature of the road's inequalities, the speed, the weight of the car and its load. Then there is another series of stresses, lateral ones, when the forward wheels are turned from side to side in steering. Finally come the reverse stresses produced by skidding and the application of the brakes.

Because of its elasticity and resiliency rubber is peculiarly fitted for the cushioning service required; but rubber possesses little strength. Therefore, in order to keep its yielding within bounds, it is necessary to incorporate with the rubber a suitable restraining material. Cotton fabric is universally used for this purpose, as it is not so sensitive to high temperatures, and is not likely to chafe.

Tire fabrics are made today either of Sea Island or of Egyptian cotton. The former originated upon a single island off our southern seaboard. The filament is a long, fine, silky one, and it contains more natural wax, and is whiter and better than the Egyptian staple. But there is not enough of the original island crop to supply the demand, and substantially all of it goes into the fabrication of expensive yarns used in making fine lace. But seeds of the original island staple have for years been planted in suitable soil on the mainland of Florida and Georgia, and thence comes the present supply of this superior cotton, which is used in the best tires. According to figures, Sea Island cotton enters into something like 25 per cent of the tire fabrics, while the remaining 75 per cent are woven out of Egyptian cotton.

The cross-section of any standard pneumatic tire makes clear at a glance the general arrangement of the different plies of fabric, the duty of each varying with the position occupied in the finished product. The purpose of this fabric and rubber carcass is to protect and hold the inflated inner tube and, at the same time, transmit to the outermost part of the tire, called the tread, the driving impulse exerted at the hub of the wheel. The carcass serves as a barrier between the inner tube and the blows incident to irregularities of the roadbed, and here resiliency is desired to obtain the cushioning effect which makes for the comfort of the occupants of the car.

The greatest care is exercised in the building of the carcass, and in order that it may do efficiently the work expected of it, tire fabrics have undergone an evolution which has demanded a

great deal of experimenting. Originally, a heavy, square-woven canvas was employed, but even when made of the very best material it failed to give satisfaction. This was particularly so when speeds increased and the weight of the cars was augmented. The ordinary square weave, with single threads in the warp and the filler, did not answer, and this was noticeably so when the successive plies were laid straight, i. e., with the warp running parallel with the circumference of the rim and the filler spanning the tire at right angles to the tread. When subjected to the varying stresses of service, one set of threads would be taut and the other slack, and, in consequence, there was a lack of cooperation.

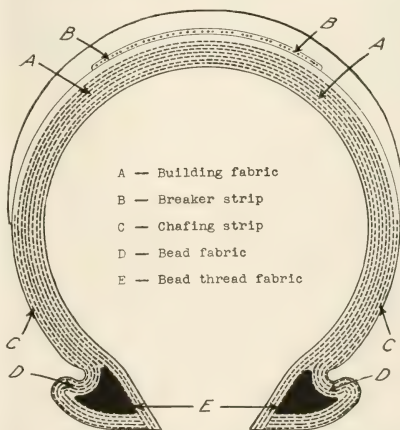
This was in part overcome by cutting the material on the bias,

and laying it on the tire core so that both warp and filler threads crossed it diagonally the texture representing a series of multiple diagonals, criss-crossing so that they pointed in the direction in which the wheel revolved. As a result, all of the threads took the stresses more nearly in line with their lengths, and offered a longer bearing surface. Also, they spanned a bigger arc, and were supported by a larger underlying volume of air within the inner tube. This meant a wider distribution of the blow or a bigger area of contact in surmounting a stone, or any other road inequality, and reduced to just that extent the chance of a bruise or rupture.

As a matter of fact, cotton thread is not inherently elastic, and it is quite apparent that a suitable tire fabric should possess this characteristic.

Army duck or square-woven canvas is devoid of this desideratum; in truth, stiffness rather than elasticity is what is commonly found in sailcloth. How, then, have the makers of tire fabrics secured strength, in the first place, out of a weak filament, and then so combined the threads that the carcass might better perform its part and approach closer to the ideal requirements for an envelope that should "bend or suffer distortion of its normal circular shape without friction or resistance other than the contained air-pressure?" The automobile tire does not perfectly meet this ideal standard, but it is a good approximate, thanks to the ingenuity of the fabric builders.

The desired degree of elasticity is imparted by a process of weaving, the threads being subjected to tension that gives to the warp and filler threads a wavy form. This is technically called "crimp." In short, the thread is virtually thus converted into a spring. It is this crimping that does the trick and provides the necessary measure of elasticity. In weaving this type of tire fabric the warp threads are given about 6-per cent more crimp than those in the filler, the purpose of this being to offset one of the consequences of calendaring. As the fabric passes between the rolls, some of the crimp in the warp is always ironed out. To balance this, additional crimp is put in the warp threads at the time of weaving, and when the frictioned fabric issues from



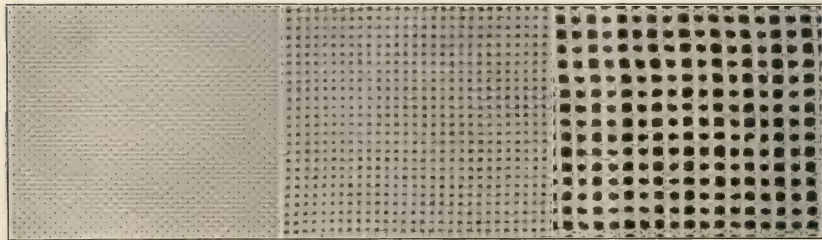
the calender the crimp of both the warp and the filler is alike.

It should be noted just here that the carcass is built, not of one type of fabric, but of several. These are the building fabric, the breaker strip fabric, the chafing strip fabric and the bead fabric.

The standard carcass fabric which has been under consideration is 17½ ounces in weight per square yard, and is made of

cross above and below the large warp yarn in a way to lock or steady it.

The "chafing strip" is a fabric used to cover the beads and the lower part of the casing. The name is self-explanatory. The weave is square, the weight varying according to the size of tire, and the threads are crimped. In some it is an 8½-ounce fabric, in others 9½ ounces, etc.



STANDARD BUILDING FABRIC,
17½ OUNCES.

BREAKER STRIP FABRIC,
SQUARE WEAVE.

BREAKER STRIP FABRIC,
LENO WEAVE.

Sea Island cotton, from combed and carded Egyptian yarn, and sometimes from carded Peeler yarns.

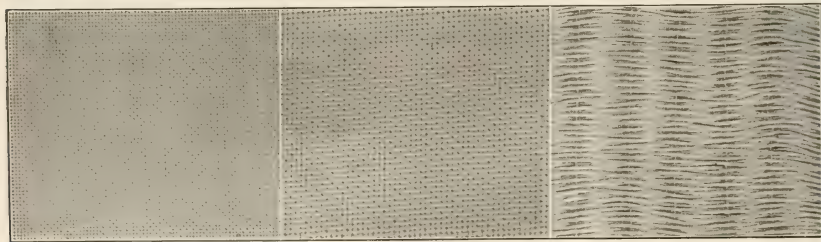
Upon the outside of the carcass is a wall of rubber, and upon this is laid what is known as the "breaker strip." The purpose of this strip is to bind the carcass and the tread intimately together; or, to put it popularly, to rivet them. The breaker strip fabric is of square weave and an open mesh composed of heavy yarn or cords, and weighing anywhere from 11 to 13 ounces per square yard. The breaker strip is a single layer, and in the best tires is made of Sea Island cotton and heavily coated with high-grade rubber. The fabric has to be strong and capable of standing up under the sidewise and the lengthwise stresses, and must support the tread of the tire effectually.

In the older style of breaker strip material, the square weave, with the open mesh, did not give the fabric stability or stiffness. It was so yielding that it could not be run evenly through the calender, and it was hard to apply the rubber coating uniformly

Tire beads are built up on a rubber core; or, in the case of a clincher tire, on a wire core, and covered with fabric. The bead is then given its proper shape by molding. The fabrics used in the beads are not standardized. However, 8 to 14-ounce fabric is recommended by many builders of reliable tires.

In addition to the regular bead fabric, what is known as thread fabric is used for tire beads. The base of this fabric is a single yarn that is twisted two-ply and reversed, and then twisted three-ply. Such fabrics used are loosely woven materials consisting primarily of single heavy warp cords held in place by widely spaced thin threads, the sole duty of which is to hold the warp in place. This fabric is calendered without regard to the fact that the threads may ride one another. The elasticity of thread fabric is increased by cabling, which means twisting with other threads, and crimping.

When thread fabrics are used for building up the carcass, which is rarely, they are proofed on a spreading machine and



CHAFING STRIP FABRIC,
8½ OUNCE.

BEAD FABRIC,
14 OUNCE.

BEAD THREAD FABRIC,
8 OUNCE.

and satisfactorily. Because of this a modification was necessary, and the present improvement, called the "Leno" weave, is now extensively employed. In this fabric the warp and the filler yarns are locked so that the material resists the spreading effect of the calender rolls without distortion. There is a single heavy warp yarn running in one direction with two smaller fillers that

then cut on the bias and rolled up with liners ready for the building machine.

Thus it is seen that the fabric or fabrics of which a motor tire is formed are fully as important as the rubber. As the United States is today by far the greatest tire making country in the world, and as the promise for the New Year is for even

greater production, a look ahead at the tire fabric demand and supply is in order.

The estimated needs of the tire producers, as the trade see it, are shown in the following table, which relates to standard 17½-ounce building fabric:

TIRE BUILDING FABRIC REQUIREMENTS FOR 1916			
Width of Cloth			
	28,500 in.	54,600 in.	7,380 in.
Tire Company A.....	1,000,000	4,000,000	14,000,000
Tire Company B.....	14,000,000	14,000,000	14,000,000
Tire Company C.....	8,000,000	2,000,000	10,000,000
Tire Company D.....	10,000,000	10,000,000	10,000,000
Tire Company E.....	4,000,000	2,000,000	6,000,000
Tire Company F.....	3,000,000	1,000,000	5,000,000
Tire Company G.....	1,000,000	300,000	1,300,000
Tire Company H.....	1,000,000	1,000,000	1,000,000
Tire Company I.....	1,000,000	1,000,000	1,000,000
Tire Company J.....		750,000	750,000
Tire Company K.....	600,000	600,000	600,000
Tire Company L.....	500,000	500,000	500,000
Other Tire Companies.....	500,000	1,500,000	2,000,000
Total.....	15,000,000	41,100,000	10,050,000=66,150,000

In addition to the above, the breaker, bead and chafing fabrics must be considered; and 8,850,000 pounds would be a conservative estimate of the amount required for these special fabrics. Thus a total of 75,000,000 pounds of tire fabric will be required for the production of tires in 1916.

Now as to supply, the mills devoted to tire fabrics can produce about as follows:

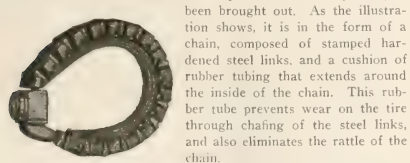
ESTIMATED PRODUCTION OF FABRIC MILLS FOR 1916	
No. 1 Mill.....	12,500,000 pounds
No. 2 Mill.....	10,500,000
No. 3 Mill.....	10,500,000
No. 4 Mill.....	10,500,000
No. 5 Mill.....	7,500,000
No. 6 Mill.....	7,500,000
No. 7 Mill.....	4,500,000
No. 8 Mill.....	4,500,000
No. 9 Mill.....	3,500,000
No. 10 Mill.....	2,000,000
No. 11 Mill.....	1,500,000
Total.....	75,000,000

While it would appear that the supply of tire fabrics is sufficient to satisfy all demands and still have stocks to spare, a condition of actual shortage is not a remote possibility. In the event of long-continued strikes at the fabric mills, the production would be heavily curtailed, and the balance between supply and demand dangerously reduced.

However, the mills have increased their capacities anywhere from 50 to 75 per cent, and, in some cases, they have doubled their plants, which would indicate that fabric manufacturers are prepared to meet the market demands for tire fabrics.

RUBBER LINED SAFETY TIRE LOCK.

The ease with which spare tires may ordinarily be detached from the sides or rear of an automobile invites their loss, a fact which has led of late to an increased use of devices for locking the tire to the car. A new variety of this accessory has just been brought out. As the illustration shows, it is in the form of a chain, composed of stamped hardened steel links, and a cushion of rubber tubing that extends around the inside of the chain. This rubber tube prevents wear on the tire through chafing of the steel links, and also eliminates the rattle of the chain.



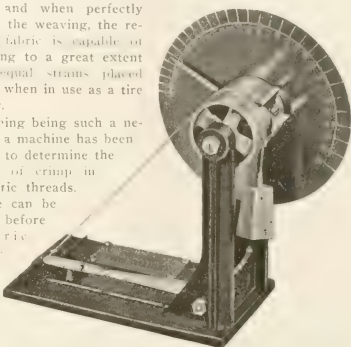
Besides the bracelet form shown in the cut, for attaching the tire to the rear of the machine, other styles—both for single tires and pairs—are made, with brackets of different forms to be attached to the sideboard, etc. Extra links can be added to make the chain as long as desired; and a different style of key is made for each lock. [Safety Tire Lock Co., Pawtucket, Rhode Island.]

A MACHINE FOR TESTING THE CRIMP OF WARP AND FILLER THREADS.

In the making of tire fabrics and, for that matter, hose and mechanical fabrics, although in a less degree, the trick of crimping the warp and filler threads is important. This gives a certain spring to the goods, and when perfectly done in the weaving, the resulting fabric is capable of equalizing to a great extent the unequal strains placed upon it when in use as a tire or hose.

Crimping being such a necessity, a machine has been devised to determine the amount of crimp in the fabric threads.

These can be tested before the fabric is crimped and then again after the



fabric has been crimped and skim coated on the calendar.

The method of using the crimp tester is as follows: Mark on the fabric two parallel lines eight inches apart and cut the fabric so that the threads with the marks on them can be reeled out. Test the warp and filler threads separately. One end of the thread with the mark on it is placed exactly under the clamp on the cylinder. The cylinder is then released and the dead weight winds the thread around the cylinder until the other mark on the thread comes even with the straight edge at the bottom of the machine. The warp now presents the appearance of a straight thread and the percentage of crimp is read directly from the dial.

THE THROPP TIRE MOLD PATENT NOT SUSTAINED.

The Thropp tire core mold patent has again appeared in the courts. This time Judge Hand, of the United States District Court of the Southern District of New York, upheld the former decisions that the patent is not valid.

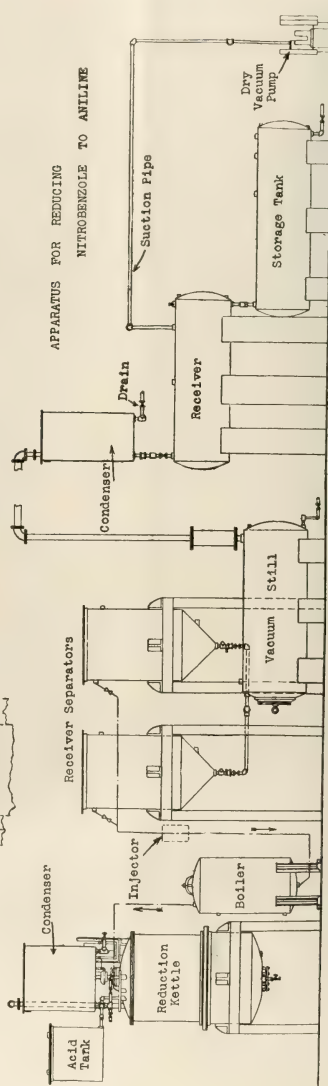
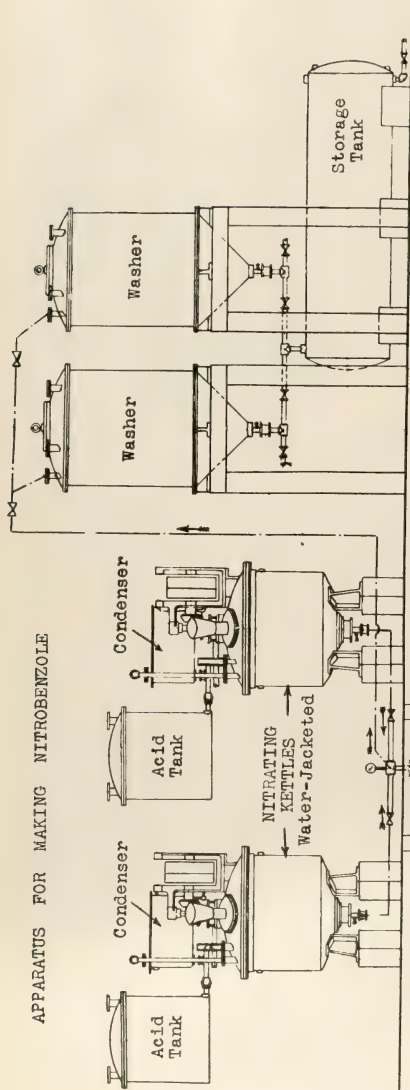
The action was brought by the DeLaski & Thropp Circular Woven Tire Co., against the United States Tire Co., and was really a continuation of an earlier suit in which the patent was declared invalid because anticipated, which decision was subsequently sustained by the Circuit Court of Appeals. The recent trial before Judge Hand was granted on the plea for the admission of new evidence.

The patent covers the molds generally used in building up, wrapping and vulcanizing tires, and is commonly used by tire manufacturers.

The successful defense of this case adds another to the list of notable cases won by Ernest Hopkinson, attorney for the United States Rubber Co., of which the defendant, the United States Tire Co., is a subsidiary. Mr. Hopkinson was assisted by his associate, Livingston Gifford.

Judge Hand, in reviewing the testimony, ruled that the mold books of The B. F. Goodrich Co. showed that open tire molds and double cure were used in 1905. He accepted the contention that Thropp made the molds he claimed in 1904, but ruled that neither curing nor semi-curing were practiced in any part of the tire that was not in contact with the mold. He held that Thropp's press of 1904 was antedated by the Fisk cold press of 1903 and 1904.

APPARATUS FOR MAKING NITROBENZOLE



ASSEMBLY OF ANILINE PLANT.

The Manufacture of Aniline Oil.

WITHIN the past five years the use of aniline in rubber goods manufacturing has increased to a marked degree the world over. Of late, special attention has been drawn to it by governmental investigations, as, for example, that cited in the December 1915 number of *THE INDIA RUBBER WORLD* on "Industrial Poisons in Rubber Manufacture." The nature, source and method of manufacture of aniline is therefore of present interest.

The chemist, Unverdorben, discovered the liquid now known as aniline in 1826, among the products of the dry distillation of indigo. In 1834 it was found by Runge in coal tar and was named by him kyanol or blue oil because it produced a blue coloration with hypochlorite. Fritzsche in 1841 gave it the present name of aniline after the indigo plant anil, from which he obtained it by distilling with potash. Commercially, aniline is obtained by a series of chemical transformations, beginning with coal tar. Among the products liberated from coal tar by distillation is benzole. Benzole, when acted upon under suitable conditions with mixed nitric and sulphuric acids, is converted into nitro-benzole. Nitro-benzole may further be acted upon and chemically "reduced" to aniline oil. The illustration, for which we are indebted to the courtesy of the J. P. Devine Co., Buffalo, New York, represents, in elevation, the assembly of a modern aniline manufacturing plant. The apparatus is in two groups, each operated continuously in 8-hour shifts.

MAKING NITRO-BENZOLE.

In the nitro-benzole section there are two nitrating units alternated in service for continuous production. Each kettle has connection with an independent acid tank and both discharge their contents into the same "acid egg" or reservoir from which, by compressed air, the nitro-benzole is elevated into either of the two washers for purification, preparatory to going into the storage tank. The capacity of each nitrating kettle is, of course, the same, since they are designed to be operated alternately. This capacity should not exceed, say, 200 gallons, in order that the heat of the reaction may be safely regulated by the water jacket circulation.

The nitrating kettle is built of acid-resisting cast iron, with extra heavy walls. Mounted upon the kettle, with suitable connections to it, is a water-cooled condenser for cooling the vapors arising from the reaction and returning them to the kettle. A hopper is also provided for introducing saltpeter in lieu of nitric acid, when desired. The contents of the kettle are mixed by a mechanical agitator operated by a tight and loose pulley on a shaft bevel-gear to the vertical shaft of the agitator. In some forms of nitrating apparatus the control of the temperature is obtained by means of water circulation through a long lead coil located within the kettle.

In operation, a mixture of nitric and sulphuric acids, of specified strengths, is intimately mingled by air agitation. The mixed acid is then run into the charge of benzole in the nitrating kettle and the agitator set in motion at about 60 revolutions per minute. The heat of the reaction is not allowed to rise above 140 degrees F. This is effected by regulating both the rate of entrance of the acid and the cooling circulation in the water jacket. Agitation is continued for about 4½ hours after the final addition of acid, when the benzole has been fully nitrified or changed into nitro-benzole. At this point the contents of the kettle are allowed to settle for several hours. The waste acid goes to the bottom and is run off into the air pressure "acid egg" below, thence it is

blown to a concentrating department for rectification. The nitro-benzole is next run into the egg and transferred to one of the washers; here it is cleaned by water agitation, settled out by standing, and finally discharged into the storage tank. In practice the yield of nitro-benzole from benzole is 154½ per cent by weight. The theoretical yield is 157.6 per cent.

MAKING ANILINE OIL.

The aniline section of the plant is somewhat more extensive than the nitro-benzole part. There is an acid tank connected to the reduction kettle; also a condenser mounted upon the latter, and various connections for the introduction of the nitro-benzole and the iron borings used in the reaction of reduction. A mechanical stirrer is operated by a tight and loose pulley, bevel-gear to the shaft of the stirrer or agitator. The kettle itself is made of extra heavy cast iron, with its bottom section provided with a removable lining of special, hard and acid-resisting cast iron. This is essential for protection of the body of the kettle from the grinding effect of the mass of iron borings in long continued movement, as well as from the corrosive effect of the acid. The agitator or stirrer has a tubular shaft to permit the access of steam to the contents of the kettle.

To produce aniline, the reduction kettle is charged with nitro-benzole and, from the acid tank, diluted hydrochloric acid is next admitted, followed by a slow feed of common cast iron borings, both acid and borings being in definite proportion to the charge of nitro-benzole to be reduced. The iron borings are fed progressively, as required, and it takes several hours for the admission of the total amount needed.

The reaction having been started, distillation proceeds and the distillate entering the condenser is returned to the kettle. The materials are added to maintain a constant level in the kettle. If the reaction becomes too violent, loss is occasioned by the formation of benzene. The reduction is complete when the kettle contains only aniline oil, water and oxide of iron. The supply of steam, at this point, is increased so as to distill over the aniline oil and water, both of which are piped to the receiver separators. Here the water and aniline oil separate by standing for 48 hours. The water contains about 3 per cent of aniline oil and is removed to a boiler, located near the reduction kettle. Here it is steam-heated and passed over into the reduction kettle to save the contained aniline from waste.

The oxide of iron from the reduction kettle is dried and may be prepared for use in the purification of coal gas from sulphur, or for the manufacture of cheap black paint.

The settled aniline oil in the separators is charged into the vacuum still for purification before storage. The total yield of pure aniline oil obtained from nitro-benzole is 71¾ per cent. As pure benzole yields 154½ per cent nitro-benzole, and the latter 71¾ per cent of pure aniline oil, the total yield of pure aniline oil from pure benzole is practically 111 per cent.

Aniline oil has a boiling point of 364.6 degrees F., specific gravity of 1.0265 at 60 degrees F. If sold as pure it should not contain over one-half of one per cent of water, and should be free of nitro-benzole. A delicate test for the presence of nitro-benzole in aniline oil is to shake a sample violently for a few minutes, and notice the color of the froth so produced. The merest trace of nitro-benzole present will give a very distinct yellow coloration.

What the Rubber Chemists Are Doing.

PROGRESS OF RUBBER CHEMISTRY IN 1915

A LEADING feature of the work of rubber chemists in 1915 is the development of vulcanization accelerators. The researches which resulted in the production of synthetic rubber developed the value of certain organic chemical compounds for improving the quality of synthetic rubber and hastening its vulcanization. Organic accelerators are not indispensable to good manufacturing results and so far are practically prohibitive in price. These are, however, decidedly interesting from a chemical point of view, and have been noticed in the patent literature and in special articles in *THE INDIA RUBBER WORLD* (December, 1914, March and June, 1915).

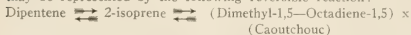
Methods of reclaiming waste have been much studied the past year and some results have been embodied in patented processes.

The published methods of analysis of vulcanized rubber perfected and issued by the United States Bureau of Standards, afford the best standard practical instructions on the subject for the rubber works laboratory. The gain in this regard is very great.

Every phase of the rubber industry, from the plantation to the finished product, is undergoing careful study and research, and knowledge of rubber is steadily increasing in consequence. Much of this new knowledge has been gathered and classified in the columns of this paper.

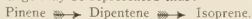
ISOPRENE FROM BETA-PINENE.

A. W. SCHORGER and R. Sayre, of the Forests Products Laboratory, Madison, Wisconsin, in the "Journal of Engineering Chemistry" (November, 1915), publish their researches on the production of isoprene from beta-pinene. The chemical relation between isoprene, the terpenes, and caoutchouc may be represented by the following reversible reaction:



The authors used a modified form of the isoprene lamp of Harries (See *THE INDIA RUBBER WORLD*, December, 1914, page 129) for conducting their experiments. Their results show that turpentine and beta-pinene, under the same conditions, yield about the same amount of isoprene, approximately 10 per cent. They consider that the isoprene obtained from turpentine is not due to the cracking of dipentene or limonene originally present in the turpentine, but that the isoprene results indirectly from dipentene.

Alpha-pinene can be converted into dipentene by heat; the condition in the apparatus would be favorable to such a transformation. The change may be represented thus:



It is not probable that either alpha-pinene or beta-pinene can be made to yield directly sufficient isoprene for the commercial production of rubber. Since good yields of isoprene are possible from dipentene, an attempt to obtain an approximately quantitative conversion of pinene into dipentene is worthy of further consideration.

RUBBER OF UNIFORM COLOR.

Beadle and Stevens have shown that the darkening of raw rubber is due to the presence of an oxydase. Pale rubber can be produced by coagulating with an excess of acetic acid, creping, and drying rapidly, preferably by heating in a vacuum, or by placing freshly coagulated rubber in boiling water from 10 to 15 minutes; but in both cases the product yields vulcanized rubber of inferior quality. By adding to the latex small quantities (1 part per 500 to 1 part per 1,000, or even less) of substances such as sodium bisulphate or formalin, which arrest enzyme action, pale rubber of uniform color is obtained and the treatment has no injurious effect on the vulcanized rubber.

The "Bulletin of Agricultural Intelligence" (1915, page 1064) recounts a simplified Schadt's process for preparing rubber. It consists in spreading a thin layer of latex over tin plates with re-curved edges. When the latex has dried, the rubber films are smoked in a revolving drum covered with perforated sheet iron, and then compressed into blocks. The cost of the process is very low, and the rubber is fit for transport two days after tapping.

PREPARATION AND PROPERTIES OF PURE RUBBER.

The investigations of F. Heim and R. Marquis on the preparation and properties of pure rubber have been published in the "Bulletin of Agricultural Intelligence" (1915, page 874). Their method was to coagulate wild Para rubber by smoke, and plantation Para rubber by acetic acid. These were purified by maceration, washing in cold water in a darkened tube and washing with acetone. When the latter had evaporated, the rubber was dissolved in ether or benzene, the solution filtered through a Buchner funnel, and precipitated with alcohol or acetone. After removing traces of benzene by digesting with alcohol, the pure caoutchouc was dried over sulphuric acid in the dark. The pure substance is white, that obtained from smoked rubber slightly yellow. Analysis confirmed the absence of resins and proteins, and the fact that pure caoutchouc is a polymer of isoprene. Solutions of it were less viscous than those of impure rubber, and the pure substance oxidized more rapidly in air than the impure, particularly when dissolved in chloroform.

TACKINESS OF RUBBER.

According to Spence, tackiness is caused by change in the aggregation of the rubber molecule and is not due to chemical change. K. Gorter finds that rubber exposed to light in sealed tubes remains unchanged when the tubes are filled with hydrogen or carbon dioxide, but becomes tacky in air or oxygen, and he concludes that tackiness is due to oxidation. In one of his experiments 3 per cent of oxygen was absorbed. Absorption of oxygen proceeds slowly for the first 6 days; it then increases and attains its greatest rapidity in about thirty days. Oxidation does not appear to be due to enzyme action, for it occurs in rubber which has been boiled in water. Aldehydes were detected in tacky rubber.

METHODS OF ANALYSIS.

DETERMINATION OF TOTAL SULPHUR IN RUBBER.—The method for determining the total sulphur in vulcanized rubber, as given by A. Hutin, consists in decomposing from 1 to 2 grams of rubber by means of 30 c.c. of fuming nitric acid, added 2 to 3 c.c. at a time. The liquid is evaporated to a syrup, made alkaline with caustic soda, and mixed with sufficient calcined magnesia to form a stiff paste, which is dried, first on a water bath and then in an air oven, at 140 degrees C., and finally ignited cautiously over a small flame so as to avoid an explosion. After ignition the mass is dissolved in hydrochloric acid and the sulphur determined by precipitation as barium sulphate in the usual way.

DRYING ACETONE EXTRACT OF RUBBER. A. Hutin holds that the acetone extract should be vacuum dried in order to obtain a residue of constant weight. Unless this is done serious errors may occur, owing to the increase in weight of the residue on drying in the ordinary way; even drying in carbon dioxide appears to be unsatisfactory.

ESTIMATION OF MINERAL MATTER IN VULCANIZED RUBBER.—A simple method for this purpose is given by H. W. Jones in "Rubber Industry," London, 1914. Two grams of the sample are heated with 40 to 50 c.c. of nitrobenzene in a 200 to 300 c.c. flat-bottom flask, connected to a reflux air-condenser. When solution of the rubber is complete, the flask is allowed to cool, the

contents diluted with acetone, stirred with a glass rod, and allowed to stand. The mineral matter is deposited rapidly and separated by decantation, transferred to a weighed filter-paper, and washed well with acetone. In some cases it is advantageous to wash further with alcohol and chloroform, then to moisten the filter with water so as to obtain a moist and uncaked residue for further examination. Little or no carbon dioxide is eliminated from calcium or magnesium carbonate by boiling for one hour in nitrobenzene.

CHEMICAL TREATMENT OF RUBBER.

UNITED STATES OF AMERICA.

RUBBER-LIKE SUBSTANCES FROM ALCOHOLS. 1,161,904. David Spence and Alexander P. Clark, assignors to The B. F. Goodrich Co.—The process consists in heating an alcoholic body (pinacolone) in the presence of a dehydrating agent (acetic anhydride) at such temperature that there is yielded a rubber-like body after prolonged heating.

UNITED KINGDOM.

COAGULATION OF LATEX.—16,096 (1914). E. Mosinger. Latex is coagulated by the addition of a solution of aluminum, bismuth or zinc chlorides, or mixtures of these. About 1 gram of one or more of these salts is dissolved in 10 c.c. of water, and the solution is stirred into 100 c.c. of latex. The rubber thus prepared is said to have physical qualities which considerably improve its commercial value.

PREPARATION FOR COAGULATING LATEX. 16,840 (1915). C. de C. Pinto, Para, Brazil. A coagulating preparation consists of a solution in alcohol of preferably 2 kilos of cresoteol, 1 kilo of quinine hydrochloride and 1 gram of sodium carbonate, which is diluted with water or the whey of rubber latex. It is recommended that 10 grams of this solution be used with 200 grams of whey for coagulating 2 kilos of latex.

SYNTHETIC CAOUTCHOUC SUBSTANCES. 17,253 (1915). A. Heinemann.—The polymerization of butadiene, isoprene, dimethylitadiene, and other hydrocarbons having double bonds, is affected by dissolving them in acetone or one of its homologues and passing sulphur dioxide into the solution. The product is freed from oily impurities by subjecting it to high pressure in a mold. It may be vulcanized or mixed with metal oxides or other fillers.

THE GERMAN EMPIRE.

PROCESS FOR OBTAINING PURE BUTADIENE. 286,640 (April 25, 1913). Bayer & Co. "Butadiene containing gas" is treated with fluid sulphurous acid for solution of the butadiene. Subsequently purified by evaporation and caustic soda.

OTHER CHEMICAL PATENTS.

UNITED STATES OF AMERICA.

ISSUED NOVEMBER 16, 1915.

- 1,160,362. Method of making a plastic body. L. H. Bakeland, Yonkers, N. Y., assignor to General Bakelite Co., New York.
1,160,363. Waterproof article of manufacture. L. H. Bakeland, Yonkers, N. Y., assignor to General Bakelite Co., New York.
1,160,365. Method of making a paper-like product. L. H. Bakeland, Yonkers, N. Y., assignor to General Bakelite Co., New York.

THE GERMAN EMPIRE.

PATENT ISSUED (With Date of Validity).

- 288,968 (June 3, 1914). Process for manufacturing rubber substitutes. Dr. Hugo Bayer, Vienna, Austria. Represented by Dr. Schönbauer, Berlin, SW. 68.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

- 476,662 (December 7, 1914). New use of rubber in footwear. J. J. Sausset.
476,826 (December 22). Vulcanized fiber sole for footwear. P. Rouanne.
476,990 (December 8). Improved treads for elastic tires. W. Henry.
476,995. Max. (Pending) device to prevent the skidding of pneumatic tires. Robin et Brault.

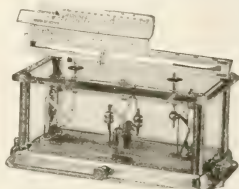
LABORATORY APPARATUS.

TORSION BALANCES FOR WEIGHT AND YARDAGE OF FABRICS.

IN every rubber factory where textile fabrics are components of the manufactured goods, as for example, those making footwear, automobile tires or proofed goods, it is a matter of constant interest and importance to keep track of fabric weights and yardage and the rubberizing upon them, expressed in weight per yard, or yardage per pound. Simple and direct means for making these determinations are available in two adaptations of the sensitive torsion balance.

WEIGHT TO THE RUNNING YARD OF FABRIC.

The balance for determining the weight in ounces or grams of a running yard of fabric is provided with a carrier and graduated scale upon which an accurately cut sample, 2 x 2 inches, of the



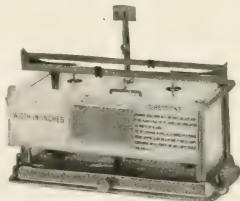
fabric to be tested is held in place by a wire clip. The right edge of this sample must be set exactly at the graduation on the carrier that corresponds with the width of the cloth. The scale is then brought to balance by means of the slide weight on the beam. The beam graduation thus indicated is the

weight in ounces or grams of the running yard or meter of the fabric. The graduations read to the fifth of an ounce, or to five grams.

YARDS TO THE POUND OF FABRIC.

The yardage of fabric to the pound is correlative to the weight per yard and is determined by a second special balance. In this instance the sample of fabric is cut 3 x 3 inches.

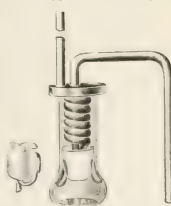
The right edge of the sample is adjusted exactly at the graduation on the carrier, shown in front of the scale box, that corresponds with the width of the fabric. The scale is then brought to balance by means of the slide weights on the beams. If the scale does not balance with the upper slide weight at the extreme right, then the weighing is continued with the lower weight, leaving the upper one to the extreme right. The position of the weight when the scale balances indicates the number of yards per pound of sample. [The Torsion Balance Co., 92 Reade street, New York.]



EXTRACTION APPARATUS.

This form of extraction apparatus is compact, simple and efficient.

It is also inexpensive and durable. All rubber, cork, ground glass or mercury seal connections are eliminated. The flask is sufficiently light to be accurately weighed, is easily cleaned and of such form that



all the extract can be transferred. The condenser is entirely of metal. [Hamer & Amend, New York.]

The Marks Reclaiming Patent Sustained.

THE Philadelphia Rubber Works Co., Philadelphia, Pennsylvania, announces that the United States Circuit Court of Appeals has overruled the decision of the District Court in Ohio and affirmed the decision of the District Court in Buffalo, sustaining the validity of the Marks or "Alkali" patent, for rubber reclaiming. The importance of the case renders the decision of Judge Lacombe of great interest.

The claim upon which the patent (No. 635,141) stands reads as follows:

The described process for devulcanizing rubber waste which consists in submerging the finely ground rubber waste in a dilute alkaline solution in a sealed vessel, in heating the contents of the vessel to a temperature of 344 degrees F. more or less substantially as specified, and in maintaining said temperature for 24 hours more or less substantially as specified.

Reviewing this and the decisions of the district courts, Judge Lacombe says:

There is a mass of testimony in the record, dealing technically and scientifically with the theories as to just how the solution of the patent acts upon the rubber scrap when the mixture is heated as prescribed in the patent. It is interesting, perhaps, but of no especial importance since it is in no way helpful towards finding the answer to the simple question: what did the patentee disclose? He advanced no theory in his specifications; it was not necessary for him to do so. All that the law required of him was a plain statement of his process set forth in sufficient detail to be understood by a person skilled in the art. If the result of his process is a product which he describes as "devulcanized rubber having substantially the characteristics of fresh rubber and capable of being used in like manner and for like purpose", and if it further appears that this is the first time that this particular process was disclosed to the world, Marks was entitled to his patent. Whether he had some theory when he applied or has one now, whether the experts have conflicting theories or not are matters of no importance.

The description of the process is couched in plain and simple language. Finely ground rubber waste is put into a vessel. This vessel itself is located in an outer receptacle capable of containing it and of being tightly closed. No special shape is prescribed for either the vessel or receptacle, they may be cylindrical or square, high or squat; it is sufficient that one shall contain the other with a space to spare between the two. Upon the rubber waste that has been put into the inner vessel there is poured a dilute alkaline solution, a three per cent solution of caustic soda being preferred. The patentee does not state the relative proportions of waste and solution, but he does give very clear and definite instructions as to the quantity of solution which shall be used. There is to be enough of the solution to permeate the finely ground rubber waste and completely submerge it. The inner vessel is then sealed up to prevent evaporation of the solution and steam is let into the outer receptacle under a pressure of 125 pounds, more or less, equivalent to a temperature of 344 degrees F. This steam pressure is maintained for the time necessary—say 20 hours.

There certainly seems to be no obscurity about these directions. The rubber waste is to be finely ground; the patentee does not say through what size mesh its particles should pass, but it might be supposed that a person skilled in the art would know what would be the range of finely ground waste; and the art of reclaiming rubber from waste (or trying to do so) was an old one. The solution is stated to be "a dilute alkaline solution"—3 per cent of caustic soda is given as preferred—but it might be supposed that one skilled in the art would know within what limits he might depart from 3 per cent and still have "a dilute alkaline solution." Presumably all rubber waste is not absolutely identical; some may require a stronger solution than others, and it might be supposed that a person skilled in the art would know how much he should vary the strength of the dilute solution in order to obtain results with the kind of finely ground waste he was treating. Certainly the patentee's statement as to

temperature and period of steam application is quite specific. Examination of the record indicates that the suppositions above postulated as to what one skilled in the art would know about "finely ground rubber waste" and "a dilute alkaline solution" are fully warranted. There is no vagueness about the patentee's disclosure of his process.

Does it accomplish its intended result? Out of the mixture of waste and solution does there, when the process is complete, remain "devulcanized rubber having substantially the characteristics of fresh rubber and capable of being used in like manner and for like purposes?"

Defendant put his expert witness on the stand to prove a series of experiments he had made, following the directions of the patent and not producing the result which the patentee claimed. This expert had never had any experience in treating rubber; practically he was not skilled in the art. It is not infrequent in patent cases to find that experiments conducted to show that a patent lacks utility turn out as it was expected they would. Plaintiff calls attention to the statement of a witness who had had large experience in treating rubber, that by following the Marks patent exactly he had produced a fair product. This defense—inoperativeness—is usually determined by the fate of another defense—infringement. If a patented process fails to produce a fair result, it will not be used commercially. Conversely if a defendant is found to use the patented process commercially, it will be presumed that he gets a fair product by its use; and it will take more than a series of laboratory experiments to show that no such product results. Reaching as we have the conclusion hereinafter expressed as to infringement, we are satisfied that the patent sufficiently discloses a process which enables a person skilled in the art to produce the result which the patentee indicates. What is the showing of the prior art? Hall No. 19,172 states that ground rubber waste should be submitted to the "operation of boiling water in caldrons, kettles, or tanks of any description." He says that lime-water or alum can be used; but the method of using is manifestly remote from Marks. Hall No. 22,217 submits the ground waste "in a close or proper vessel to the action of steam direct upon the rubber, or in connection with water, for 48 hours." This is not the Marks process. Hall 25,160 provides for placing the ground waste "in a close steam boiler or other suitable vessel, into which steam is conducted through a steam pipe. In its passage through the pipe the steam is superheated." This also is not the Marks process. It would be a waste of time to enumerate all the prior patents in the record, some suggesting one element, some another of Marks' process. We may proceed at once to the patent to Mitchell No. 395,987, January 8, 1889, which both Judge Clarke and Judge Hazel concur in holding comes nearer than any other to suggesting the process of the patent in suit. The discussion of this patent in their several opinions may be read; they reached opposite conclusions. Judge Clarke finds that it "comes very close to being, if indeed it is not, a clear anticipation of the process of the Marks patent." Judge Hazel finds that Mitchell's process "debeferized rubber waste by the use of acid and pressure and then devulcanized it by an additional step after washing out the caustic soda"; while Marks, on the other hand, "debeferized, desulphurized and devulcanized waste rubber by a single operation and in so doing achieved a different result from Mitchell." After a careful study of the two patents in the light of the discussion of them by experts and counsel, we entirely concur with Judge Hazel's conclusions. This Mitchell patent cannot be transformed from a two-step process to a one-step process merely because in an English patent (20,289 of 1889) Mitchell recommended a one-step process to be carried out by the use of other agents than those specified in Mitchell 395,987, and in Marks. In this English patent we find recommendations to use iron in the form of borings or filings, or even larger pieces, turpentine, bisulphide of carbon and naphtha. The following excerpts from the Mitchell patent 395,987 indicate to us quite clearly that Judge Hazel's construction was a correct one. After describing a process for removing fibre and mineral matter, Mitchell says:

Where the waste is unvulcanized this ends the process. * * * When, however, it is desired to devulcanize the rubber, I subject it to further treatment, as follows: Immediately after washing out the mud and

before the contents of the vessel have had time to cool I again close the cock of the blow-off pipe E and force in steam until a pressure of say 125 pounds and a temperature of 383 degrees F. have been reached, by maintaining which for a period of from 12 to 36 hours the rubber will be devulcanized.

Before the steam is thus applied the defiberized waste has been thoroughly washed first with hot and then with cold water. It is the subjection of this thoroughly cleaned waste directly to steam under pressure which, as Mitchell's patent states, "devulcanized" the rubber. We are unable to see how such a process can be held to anticipate Marks' process, or even to approach it so closely as to negative invention.

As to the defense of alleged prior uses it seems unnecessary to add anything to Judge Hazel's discussion of this branch of the case.

The only witness available to show what process defendant employs was a detective; such process being carried on in secret. We concur with Judge Hazel that his testimony made out at least a *prima facie* case of infringement. Inasmuch as defendant introduced no evidence to show either that its process was or what it was not (Badische Anilin v. Kipstein, 125 F. R., 543), we think infringement was sufficiently proved.

INSURING RUBBER PROFITS AND COMMISSIONS.

IT is generally acknowledged that insurance can be written covering almost every known risk. That the importer can be insured against loss of profits accruing from sales of crude rubber, and brokers protected against loss of commissions, is comparatively new to the American rubber trade.

Should an insured rubber shipment be lost in transit, the importer is protected and collects the full value from the insurance company. That is all very well as far as the value of the goods is concerned, but it does not satisfy the customer for whom the goods were bought under contract. The order must still be filled. In the meantime something may have sent rubber prices sky-rocketing and the importer is obliged to fill his contract with rubber purchased at a higher price, resulting in a substantial loss instead of the expected profit.

To guard against this he insures his importation at an increased price over the value of the goods or, in other words, insures his profits. So, too, the rubber broker insures against loss of commissions due him on shipments of rubber in transit that may never reach their destination.

If rubber manufacturers could also insure themselves against loss in manufacture, such as blistering, over and under cure, general damage in making up, etc., as well as against claims for wear, returned goods and adjustments, the insurance cycle would be nearly complete.

CRUDE RUBBER AS PASSENGERS' BAGGAGE.

Some idea of the desperate straits to which Germany has been reduced by the British rubber blockade was obtained when a search by members of the neutrality squad of the United States secret service, of the baggage of a woman passenger to Holland on the steamer *Ryndam*, revealed the presence of nearly 3,500 pounds of crude rubber. It was subsequently learned that the rubber had been purchased through a dealer in New York, by agents of the rubber department of the Deutsche Bank, Berlin, a government institution. Its purchase and shipment were in accordance with a scheme worked out by one Max Jaeger, an accredited agent of the bank, which, with the arrest of Jaeger and the *Ryndam's* passenger, has been nipped in the bud. The offense with which the prisoners will be charged is failure to manifest goods exported to foreign lands in the course of trade, for profit. It is asserted that had the first shipment been successful, other passengers with similar consignments would have followed at regular intervals.

CONTRABAND RUBBER SHIPMENTS BY PARCEL POST.

THE seizure by British authorities of parcel post mail, on steamers flying the flag of a neutral nation, has caused many protests against this interference with the sacredness of the mails as guaranteed by international postal conventions to which Great Britain is a party. This is not, however, the main question involved.

When the rubber manufacturers of the United States undertook, in consideration of being supplied with plantation rubber from British possessions, to guarantee that such rubber, either crude or in manufactured form, should not pass into the hands of an enemy nation, the engagement was accepted in good faith by Great Britain. Under the circumstances, it would have been a breach of faith on the part of those who had signed the guarantees to connive at or close their eyes to deliberate attempts to evade the agreement. And, moreover, the discovery that rubber in considerable quantities was being thus diverted might cause an immediate re-establishment of the "embargo," with effects on the American industry that can readily be imagined.

A profitable traffic in shipping by parcel post is undeniable, when rubber bought in New York at approximately 80 cents per pound is sold in Berlin at \$12 per pound, at a cost for transportation of 12 cents for 11 pounds. The protest against the seizure of the parcel post rubber no doubt emanates from those engaged in this profitable business.

RESULTS OF THE INTERDICTION OF RED CROSS RUBBER SUPPLIES.

The refusal of the British to allow the shipment of rubber goods for hospital purposes to Germany and Austria, referred to in the last number of *THE INDIA RUBBER WORLD*, is already bearing fruit. Miss Emma Duensing, a young woman of German birth, a graduate in nursing of the German Hospital, New York, who had served six months in Porto Rico, during the Spanish-American war and a year in the Philippines, as a volunteer nurse, lost her life while nursing the wounded at Oppeln, Silesia. Miss Duensing contracted septic fever, it is believed as a result of lack of the protection rubber gloves would have afforded her in handling an infectious case.

MUCH LITIGATED RUBBER.

An interesting case, in which the price of imported rubber figures, was recently decided by the Appellate Division of the Supreme Court in New York. The Mansfield Tire & Rubber Co., Mansfield, Ohio, contracted to purchase from Rossbach & Bros. 24 tons of brown crepe at 98 cents, and 9 tons at \$1.05 per pound, delivery to be made monthly from the date of contract, August, 1912, until September, 1913, on requisition. The price of rubber increased materially and the rubber company claimed that deliveries were not made as required and that the sellers sought to change the terms of payment, to which they would not consent. Deliveries then ceased until the following May, when the price of rubber declined heavily. The rubber company then refused to accept tenders of the rubber made at the contracted price, on the ground that the contract had been violated by previous non-delivery of the goods by Rossbach Bros. Thereupon the latter firm brought suit against the rubber company for \$34,226, in the Supreme Court, New York, claiming that this represented the difference between the contract price of the rubber and the price they had eventually been compelled to accept for it, viz., 47 cents per pound. After a trial that lasted a week, during which the facts and evidence were fully presented by each side, the jury brought in a verdict in favor of the rubber company, with costs against the plaintiffs, on the ground that the plaintiffs had broken the contract when they failed to deliver the rubber.

The plaintiffs carried the case to the Appellate Division, which affirmed the verdict of the inferior tribunal.

New Goods and Specialties.

LEWIS "NOJAR" RUBBER RETAINED AUTO CLOCK

If an automobile clock is to prove a reliable timepiece and not a mere ornament, it must be very securely encased to prevent all danger of jarring or vibration. Rubber is the ideal casing, as it absorbs vibration, is non-conducting and therefore keeps the clock free from the effects of any electrical disturbance. The heavy red rubber casing fits firmly around the clock, which is attached by drilling holes in the dash at a distance matching the stationary bolts attached to the steel plate embedded in rubber. A special style for Ford cars is also made. Seneca G. Lewis, general manager of the Pennsylvania Rubber Co., is the inventor. [Pennsylvania Rubber Co., Jeannette, Pennsylvania.]



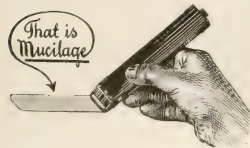
THE "AUDUBON" UMBRELLA HANGER.

Umbrellas invariably rust out at the peak; they are always falling down, or, if left with others in an umbrella stand, they are injured by rubbing against them, if not actually torn by the peak of an umbrella carelessly placed in the stand. The "Audubon" umbrella hanger is a simple and convenient device, which provides a rubber holder in which the peak of the umbrella is inserted, and a ring in the top of the holder to hang upon the closet hook, as shown in the accompanying illustration. The umbrella hangs in an inverted position, thus preventing the ends of the frame from catching on clothing. The holder protects the umbrella, as coats are protected by coat hangers and shoes by shoe trees, and its life is, therefore, greatly prolonged. [The Cantine Co., Inc., New York.]



A CONVENIENT MUCILAGE APPLIER.

The B & S mucilage applicator is a very modern device, designed to prevent the petty annoyance and waste of material incidental to the use of mucilage pots or paste jars. It is made of hard rubber, 5 inches long, 1 inch wide and $\frac{3}{4}$ of an inch thick. Slight projections on both sides, at each end, keep it off the paper if laid down carelessly. The soft rubber tongue at one end bends back as it is pressed against the surface to be gummed, uncovering an opening in the hard rubber underneath and allowing the mucilage to flow. It has a pneumatic feed, a slight pressure on the sides accelerating the flow when desired. As the tongue is lifted from the paper it springs back into place, stopping the flow and sealing the opening like a cork. To refill, it is only necessary to unscrew the cap at the other end and screw on a collapsible tube of mucilage, reversing the operation after squeezing the mucilage out. If it is desired to carry the applicator in the pocket, a hard rubber cap is supplied. [Sengbusch Self-Closing Inkstand Co., Milwaukee, Wisconsin.]



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THE CAMDEN WATERPROOF COAT.

Automobile clothing have reached a high point of combined comfort and good looks. They are no longer clumsy or inelegant, yet they excellently serve the purpose for which they are intended. The black Para rubber-coated garment in the first illustration has elastic cuffs at the sleeves and a drawstring at the neck, affording the absolutely close protection needed against driving rain and that aggravating kind of snow which sifts gently in at the smallest opening. The coat fastens with clasps, folding over, double-breasted fashion. The length is 52 inches, and it is supplied in three sizes and three weights, for both men and women, and is folded in a compact rubber bag. Its eminent suitability as a fishing coat also will be readily seen.



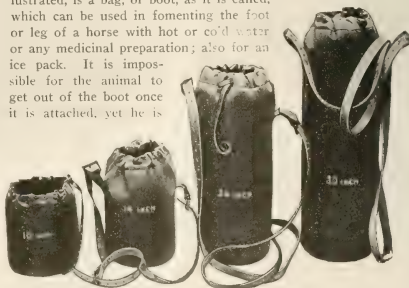
The rubber apron shown in the second illustration thoroughly protects the clothes when washing the car or doing

ing the unavoidably dirty work about a garage. It is black in color, and is strongly made, to suit its utilitarian purpose. This apron is supplied in light, medium or heavy weights, 44, 46 or 48 inches in length, the width being about 34½ inches. [The B. F. Goodrich Co., Akron, Ohio.]



SOAKING AND FOULICING BOOTS FOR HORSES.

A great majority of equine ills are due to foot and tendon troubles, and it is no easy matter to attend to these ailments properly. A thoroughly practical aid in their treatment, here illustrated, is a bag, or boot, as it is called, which can be used in fomenting the foot or leg of a horse with hot or cold water or any medicinal preparation; also for an ice pack. It is impossible for the animal to get out of the boot once it is attached, yet he is



able to move about the stall without annoyance and requires little attention.

In the three larger sizes there is a valve, placed near the bottom, through which the water is released before removing the boot. A narrow strap gathers the soft top of the boot tight to the leg, preventing the radiation of heat when hot water is used; but if it should become too cold, some of the water may be al-

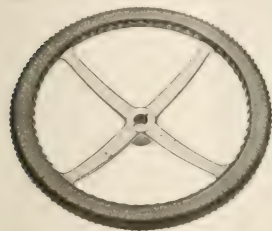
lowed to escape through the valve and the temperature may be raised by the addition of more hot water.

These boots are 6, 8 and 10 inches in diameter and range in height from 10 to 30 inches. They are made of heavy canvas with an increasing number of plies toward the bottom, to above the top of the hoof, and have an inside lining and an outside covering of rubber. In addition there is a removable reinforcing bottom which protects the boot in case it should be necessary to soak the foot without removing the shoe. Canvas and rubber straps are used as fastenings, the strap on the three larger sizes passing over the animal's back, while the small-sized boot fastens above the fetlock. [Voorhees Rubber Manufacturing Co., Jersey City, New Jersey.]

AUTOMOBILE STEERING WHEEL.

An improvement on the ordinary steering wheel for automobiles is one made of Condensite, a product which comes

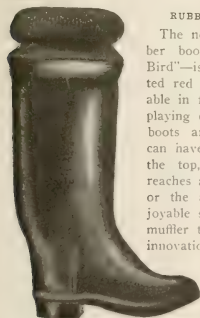
very close to being synthetic hard rubber. The edges are notched, which prevents the hands of the driver from slipping. The wheel is jet black and finely polished similar to that of hard rubber, and the manufacturers claim that it retains this appearance; also, that it is very elastic, and will



not crack on the spindle. [Essex Rubber Co., Inc., Trenton, New Jersey.]

RUBBER BOOTS WITH MUFFLER TOP.

The novel feature in this child's rubber boot—pleasingly named the "Red Bird"—is the muffler top, made of knitted red wool and as cosy and comfortable in feeling as it is in looks. When playing out in the snow or wet, rubber boots are the best protection a child can have. But cold winds can enter at the top, and—if youthful enthusiasm reaches a high enough pitch—even snow, or the aftermath of a particularly enjoyable splash in a puddle. The woolen muffler top is therefore a very practical innovation for that friend of children's playhours, the ever-useful rubber boot. [Canadian Consolidated Rubber Co., Limited, Montreal, Canada.]



INDOOR EXERCISING APPARATUS.

The horizontal exercising bar here illustrated is provided with rubber cushions at each end. When the bar is fitted into a doorway and turned with the hands it makes a wedgelike contact between the rubber and the sides of the doorway sufficient



to sustain the weight of a heavy man. The bar is made of selected hickory, and has steel tubular ends into which the iron sockets holding the rubber cushions screw. It is used for chinning exercises and also for abdominal work, being adjustable to any height. [A. G. Spalding & Bros., New York.]

Another indoor apparatus for athletic exercise, in which rubber is used, is a vaulting pole of bamboo, wound at short intervals with friction tape. [Wright & Ditson, Boston, Massachusetts.]

TRIPLEXED STEAM HOSE

A new hose, that combines the flexibility of rubber hose and the resistibility to pressure of the all-metal hose, has lately appeared on the market, and is of interest to steam users.

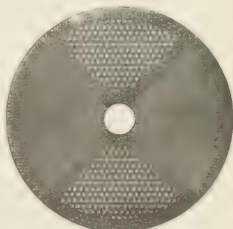


It is built as follows: The metal inner tube is of special ball-bearing construction, overlaid with a magnesia composition, around which is spun a woven insulated fabric, covered by a coating of rubber with a woven jute covering for protection.

The metal tube carries the pressure, while the magnesia is to prevent heat conduction, and the next layer is for insulation. The woven fabric prevents kinking of the hose by being woven to the maximum bend that the hose will describe—the smallest circle that may be permitted without strain. [Metal Hose & Tubing Co., Brooklyn, New York.]

RUBBER MAT FOR REVOLVING DOOR.

This rubber mat is specially designed for use with revolving doors, and can be obtained in any size by giving the diameter of the circle required, the size of the center post on which the door revolves, and the distance from the center post to front and back. It is made in four sections. The front and back sections are perforated, and the two side sections are made of solid rubber, which gives additional weight to the mat and insures an absolutely safe foothold when passing through the door. [New York Belting & Packing Co., New York.]



ALL-RUBBER SIPHON.

In transferring liquid from a cask with a piece of hose or tubing, the air must first be expelled before the flow commences. The old method of starting the flow by inserting the hose in the liquid and sucking on the other end is of course a very unsanitary one. The labor, the waste of material, and, most im-



portant of all, the lack of hygiene in this method can readily be seen. All these undesirable factors are eliminated by a modern device called the "Queen City Siphon," in which a rubber bulb at the end of the tube performs the necessary service. Two compressions of this bulb will start the flow, which can be in-

stantly stopped and started again by turning the hard rubber stop cock. The construction is simple and there are no metal valves to clog, corrode, or otherwise get out of order. These siphons are made in four sizes, the flow varying from $\frac{3}{8}$ of an inch to 1 inch. [The Schaefer Rubber Co., Cincinnati, Ohio.]

THE MONARCH ADJUSTABLE AUTO LAMP DIMMER.

City ordinances require that the glaring headlight on automobiles be subdued, and this requirement has brought on the market many types of "dimmers" in the form of opaque shields covering half the light. A practical device for this purpose, which can be attached to the lower or upper part of the lamp, is shown herewith. The shield is made of strong, rubberized cloth, to withstand the rains that drive in upon it.

A coil spring gripping the lamp holds the dimmer in place in spite of the constant jarring of the machine. This dimmer is made in five sizes, to conform to almost any size or style of lamp. [The Monarch Carriage Goods Co., Cincinnati, Ohio.]

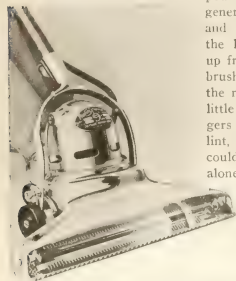
THE "HELDTITE" SHAVING BRUSH.

Every man who shaves himself has no doubt experienced the uncomfortable sensation brought about by the lather running down his wrist from the brush. The shaving brush here illustrated prevents this annoying occurrence by means of a drip cup made of pure rubber, which surrounds the brush at its base. The handle is suitably shaped so that the brush can be placed in a standing position. The ferrule is made of aluminum. The manufacturers claim that the specially made lather brush is the only one that will both spread the lather and rub it in at one operation; also that the ferrule and handle will not swell, shrink, crack or loosen.

The many practical features of this useful article will appeal to every man who shaves himself. [Heldtite Brush Co., Inc., Troy, New York.]

AN ELECTRIC CLEANER WITH A SOFT RUBBER BRUSH.

Rubber has lately been made use of in improving the almost indispensable vacuum cleaner. The Premier is an electrically and light, weighing only nine pounds. Bristle brushes are generally used to stir up lint and dust, but in this machine the rubber being in the form of little fingers. These rubber fingers just touch and loosen hair, lint, thread and ravelings which could not be removed by suction alone. After loosening, this material is carried into the dust-proof bag by the strong air current. [The Franze Premier Co., Cleveland, Ohio.]



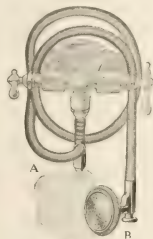
THE McCORMICK WEATHERSTRIP.

This is used on an automobile windshield, and is claimed by the makers to eliminate all danger that cold wind, rain, hail or sleet may find its way through the space between the upper and lower panes to the occupants of the car. It is designed to fit the upper edge of glass on the lower section of the windshield.

The single flange, or lip, is forced against the outside face of the upper glass, as the shield is brought in a vertical position, and a water-tight connection is thus established between the panes. Or, if it is desired to have the upper glass swing forward freely, the strip holds equally tight on the inside. A light pressure of the thumb adjusts the strip, and it is removed with corresponding ease. When not in use it can be coiled and placed in the door pocket, under the seat, or in any other place where it will be out of the way and yet readily accessible. [The Robinson Manufacturing Co., Louisville, Kentucky.]

THE WATROUS BATH FIXTURE.

In the bath spray attachment here illustrated it is possible to adjust the volume and temperature of the water as desired before it is released from the spray. The water flows through a relief valve *A*, which prevents all danger of the hose blowing off and insures a uniform flow. It is kept from passing through the spray by a regulator *B*. When properly adjusted, a slight pressure of the thumb at *B* starts the spray, the relief valve *A* closing automatically. This fixture is easily attached to any bathtub, and a fountain syringe attachment is also supplied, which can be interchanged, as desired, with the bath spray head. [The Watrous Company, Chicago, Illinois.]



PNEUMATIC PENHOLDER.

The special feature in this latest addition to a well-known line of pneumatic penholders lies in the extra length of the pneumatic rubber tip, which extends over half the length of the holder. "Writer's cramp" is a common ailment among constant wielders of the weapon accredited mightier than the sword. The

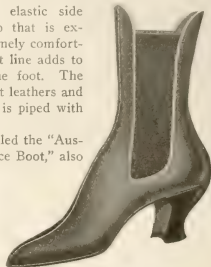


device of a heavy, soft, pneumatic rubber cushion for the fingers greatly lessens the strain and, consequently, the danger of ill effects from long continuance of a certain position of the hand. The rubber cushion on this penholder is a veritable pneumatic air cushion, made by a patented process. [American Lead Pencil Co., New York.]

SHOES WITH ELASTIC SIDE GORE.

Among the manifold novelties of a season of fascinating footwear, several manufacturers are showing boots in which a side gore of silk elastic is used. In the "Parade Boot," here illustrated, this elastic side gore gives a close-fitting top that is exceptionally neat and yet supremely comfortable, while the unbroken front line adds to the slender appearance of the foot. The "Parade Boot" comes in patent leathers and colored kid. The one shown is piped with white kid.

A dancing boot for men, called the "Austrian Officer's Full Dress Dance Boot," also makes use of the convenient silk elastic side gore. This boot does not slip at the heel in dancing, like the ubiquitous pump, and cannot bind the instep like the laced Oxford. As a rule, men's dancing shoes are notably lacking in comfort, and this boot should prove a popular innovation.



The Editor's Book Table.

CHEMICAL TECHNOLOGY AND ANALYSIS OF OILS, FATS AND WAXES. By Dr. J. Lewkowitch, M.A., F.I.C. Fifth edition. Macmillan & Co., Limited. London, 1915. [3 vols., cloth, 8vo, 483, 688 and 944 pages. Price, \$6.50 per volume.]

THIS book deservedly stands in high esteem among chemists, and its author is an acknowledged authority on the subject of oils, fats and waxes. The plan of the work is progressive.

The first volume begins with the classification of oils, fats and waxes, and discusses their physical and chemical properties, followed by a chapter on saponification, and one on the various series of fatty acids, and the series of alcohols derivable from fats. Preparation of fatty matter for physical and chemical examination, and the application of these methods, occupy the next four chapters, both quantitative and qualitative methods being given. Methods for the examination of mixed fatty acids occupy a section of 80 pages, succeeded by chapters on examination of unsaponifiable matter; detection and determination of rosin. The first volume concludes with the application of the methods to the systematic examination of oils, etc., and a discussion of examination by strictly scientific methods.

The second volume is devoted to the technology of the natural oils, fats and waxes, taking up the commercial preparation of the raw materials used in those industries, the methods of refining them and detecting adulterations. In this section the oils are classified as vegetable and animal; and so also are the solid fats and waxes.

Each oil, fat or wax is treated individually in the sub-division of its proper group, where its characteristics are indicated, its properties fully discussed, tests given and commercial value indicated. In this part are descriptions of the rubber seed oils from *Manihot*, *Funtumia* and *Hevea* rubber tree seeds. These are all classed as drying oils. The *Hevea* seems to be the most important source of rubber seed oil. "Since the productive plantations in the East have become very extensive, a larger supply of seeds is available and their export for purposes of oil production may increase, especially so as the vitality of the seeds for production of seedlings is very feeble. * * * It is estimated that one ton of kernels [414,400 seeds] delivered in England would cost £6 10s. [\$31.60]." The cake would be unsuitable for cattle feeding, and would have to be used as manure. These figures do not seem to indicate that *Hevea* seed oil may be expected to become an extensive article of commerce.

The third volume takes up the consideration of the technology of manufactured oils, fats and waxes, and commercial examination of the products of the oil, fat and wax industries; concluding with the technology of waste oils, fats and waxes and the commercial products derived from them. Under the first division are considered the industries having for their object the refining of oils and fats, and their application to commercial use; as, for example, edible oils, illuminating oils, paint oils and lubricants. Next follows consideration of the industries in which the glycerides undergo a chemical change, but are not saponified, namely, polymerized oils, boiled oils, oxidized oils, vulcanized oils or rubber substitutes, etc. In the latter instance the processes of manufacturing both the dark substitute and white substitute are given in general terms.

The candle, fatty acid, soap and glycerine industries are similarly treated. The technology of waste oil products is important and interesting. These products are chiefly greases.

The set of three volumes is fully indexed in the third and last volume. This work on oils, fats and waxes is a valuable work for any chemist's library, especially to the rubber works chemist who is often called upon to examine oils and products containing oils used in rubber goods manufacture.

CHEMICAL CALCULATIONS. BY R. HARMAN ASHLEY, Ph.D., New York, D. Van Nostrand Co., 1915. [Cloth. 8vo, 276 pages. \$ 8.00 net.]

The author, in his preface, states that this text-book on Chemical Calculations follows more closely than usual the needs of students who will later find occupation in chemical laboratory work. The book, therefore, contains constant reference to chemists' handbooks, particularly to "Van Nostrand's Chemical Annual for 1913." It will be found a valuable source of help by practical chemists and laboratory analysts in their routine work. The text-book is entirely mathematical, the problems treated relating to ratios, approximate numbers, interpolation, heat, specific gravity, gas calculations, calculations of atomic weights and formulae, gravimetric and volumetric analysis and the use of specific gravity tables and acid calculations.

TRADE DIRECTORY OF CENTRAL AMERICA AND THE WEST Indies, 1915. Published by the Department of Commerce, Washington, D. C. [Cloth, 8vo, 255 pages.]

Printed in legible type in well-arranged and not overcrowded pages, and neatly bound in dark-red buckram, this work was compiled in the Bureau of Foreign and Domestic Commerce of the Department of Commerce from information supplied by United States consular officers. It is a directory of Central America and West Indian buyers and is a supplement to the Trade Directory of South America, published by the Department in 1914. Classification is according to countries, principal cities and trading centers, and the nature of the goods handled, with index and classification schedule and concise notes regarding the location, population, transportation facilities and exports of each point. It is easy of reference and should be a valuable addition to the library of every manufacturer, merchant or exporter doing business with these countries. Copies are obtainable, at 60 cents each, from the Superintendent of Documents, Government Printing Office, Washington, D. C.

THE RUBBER INDUSTRY OF THE AMAZON, AND HOW ITS Supremacy Can Be Maintained. Based on the experience of Joseph F. Woodroffe, author of "The Upper Reaches of the Amazon"; edited and with additions by Harold Hamel Smith, editor of "Tropical Life." John Bale, Son & Danielson, Limited, London, 1915. [8vo, 435 pages, with statistical tables and 48 illustrations.]

The authors of this compilation of interesting and valuable information on the Amazon rubber industry are abundantly qualified in knowledge and experience to speak with authority.

How Brazil's supremacy can be maintained when she has occupied second place as a rubber producer since 1913, is puzzling, to say the least; however, many potential theories are advanced whereby Brazil's rubber supremacy may be ultimately regained. The book in general is an earnest appeal for the development, preferably by English capital, of the languishing Amazon rubber industry along the practical lines suggested and supported by many facts and figures.

The labor question, as it should, occupies the first place and is treated with the careful consideration due this subject, upon which the success of tropical ventures invariably depends. The natives are to be encouraged to greater effort, that will result in better laborers, rubber tappers and planters of food-stuffs. Large numbers of Japanese, Chinese and Siamese agriculturists must be imported to form colonies and intermarry with the natives to produce the new blood and sinew that are so urgently required.

The pages devoted to the history and description of the industry from the early days of the *seringas* of the aborigines to the present-day methods of collecting the milk and the preparation of modern *pelles* of upriver fine rubber are particularly accurate and interesting.

The *Seringuero* is quite the most heroic figure in all that vast land of jungle and river. The reader is brought in close touch with his humble home, his daily life and the unequal struggle that he is constantly waging against overwhelming odds in his effort to make a living for himself and family. The government does little or nothing for this intrepid and deserving type, that will in time entirely disappear unless healthy surroundings and better conditions are provided for their welfare. How this should be done is told in the chapter on "The Future Homestead of the *Seringuero*" in a convincing and practical manner that leaves little to be said on the subject of Brazil's salvation. The last chapter is an excellent review of the common interpretation of the Monroe Doctrine from the British viewpoint, and its adverse effect on Latin American trading possibilities.

NEW TRADE PUBLICATIONS.

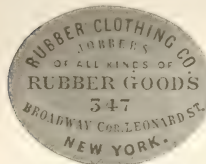
THE Quaker City Rubber Co., Philadelphia, Pennsylvania, issue catalog No. 17, covering their mechanical rubber goods, prefaced with a modest introduction in relation to the magnitude and complete modern equipment of their plant. Glancing over the 180 artistically printed and profusely illustrated pages of this handsome publication, it would seem that the company's productions cover a most complete line of mechanical rubber goods. In the line of packings the assortment is notably complete, the description accompanying each variety being highly instructive and interesting; neatly bound, with a frontispiece in color, showing the company's extensive plant, also front views of its branch stores in New York, Chicago, Pittsburg and Philadelphia.

Wearing Candee Rubbers, conspicuously displayed and flaunting a banner with the legend, "Candee Kids," two rosy-cheeked youngsters on a flying sled, announce the Candee Rubbers in a very appropriate and artistically printed standing card, sent out as a seasonal reminder by the United States Rubber Co., Fifty-eighth street and Broadway, New York. Accompanying it is a standing figure of a typically rubicund and rotund Santa Claus, bearing, as an appropriate gift for the young folks, a "Unika" brand St. Nick. rubber boot, which, with its red moire shaft, in delightful contrast to the shining black foot, would captivate any youngster of either sex.

"Saving Dollars on Truck Tires" is the title of a series of eight interesting and instructive bulletins recently published, in folder form, by the Goodyear Tire & Rubber Co., Akron, Ohio. The first covers the subject of truck tire conservation and abuses that must be guarded against to obtain big mileage. The other bulletins are devoted to simple precautions against the following: Overloading, Speeding, Car Tracks, Rough Roads, Neglected Cuts, Non-Skid Devices, and Wheel Irregularities.

A UNIQUE ADVERTISEMENT.

Through the courtesy of A. W. Smith, western representative of the Goodyear's India Rubber Selling Co., Chicago, Illinois, we are able to present a reproduction in full size of a hard rubber disc, issued in 1863, as an advertisement by the Rubber Clothing Co., 347 Broadway, New York. The reverse side of the disc bears, in relief, a complete calendar for that year; but although perfectly preserved and to sharp eyesight quite clear, the figures are so minute that their reproduction in natural size was not possible. The little rubber "card," of which there is hardly likely to be another in existence, was in its time doubtless a unique and highly prized advertising novelty.



APPROPRIATE AND ARTISTIC HOLIDAY GREETINGS.

WE were agreeably reminded of the near approach of the holidays and the opening of a new year, by the appearance, on the editorial desk, of useful and attractive objects, in infinite variety, from friends desirous of expressing kindly remembrance. For these reminders, which we enumerate below, we take this means of expressing our thanks and our collective and cordial reciprocation of the good wishes with which these many attractive and enduring forms of greeting are accompanied.

SOUVENIRS AND NOVELTIES.

A handy wallet of rich brown leather, stamped in gold with the sender's compliments, comes to us from the Monatiquot Rubber Works Co., manufacturers of reclaimed rubber, at South Braintree, Massachusetts. Accompanying the gift is an appreciative greeting, on a neatly printed card displaying the company's trade-mark.

"Vac," in the person of a jet-black Boston bull terrier, comes with the season's greetings from the Pennsylvania Rubber Co., Jeannette, Pennsylvania. "Vac" probably derives his name from the Vacuum cup tires, made by his donors, and will make an attractive paper weight for any desk, besides serving as a reminder of the sender's good wishes for 1916.

Accompanied by a note of greeting and explanation, the Standard Emarex Co., New York, distributed to its friends and customers a miniature rubber tire paper weight, packed in an attractive box. The stock used in the paper-weight tire is described as containing 50 per cent of M. R. X., the mineral rubber which the company manufactures, and the specimen is sent out to show how admirably M. R. X. combines with rubber.

CARDS AND CALENDARS.

S. Birkenstein & Sons., dealers in scrap rubber, Chicago, Illinois.

E. H. Clapp Rubber Co., manufacturers of reclaimed rubber, Boston, Massachusetts.

J. W. Coulston & Company, importers of chemicals, New York City.

The J. H. Day Company, mixers for rubber compound, Cincinnati, Ohio.

Dominion Rubber System of Canadian Consolidated Rubber Co., Ltd., manufacturers of rubber goods, Montreal, Canada.

Gibney Tire & Rubber Co., wireless solid tires, Conshohocken, Pennsylvania.

Kelly-Springfield Tire Co., manufacturers of tires and tubes, Akron, Ohio.

L. J. Muttly Company, rubber cloths and tubing, Boston, Massachusetts.

New Jersey Rubber Co., Lambertville, New Jersey, dealers in all kinds of reclaimed rubber.

The Portage Rubber Co., manufacturers of tires, Akron, Ohio.

Quaker City Rubber Co., manufacturers of Quaker tires and mechanical rubber goods, Philadelphia, Pennsylvania.

DRY COST CALCULATOR.

The Acushnet Process Co., New Bedford, Massachusetts, issue a very neat dry cost calculator for crude rubber. By its use the net cost of crude rubber, up to \$2.50 per pound, can easily be ascertained at a single setting on the instrument of the purchase price and percentage of shrinkage. The instrument is circular, of heavy celluloid and may be obtained gratis by representatives of rubber companies on application.

New Machines and Appliances.

BIRMINGHAM PNEUMATIC TIRE TREAD MACHINE.

THIS machine is of special interest to tire manufacturers, as it turns out treads superior to the hand-laid product, and at a lower cost. Another advantage is in its adaptability for laying up inner flaps—an item which is very large in some mills.

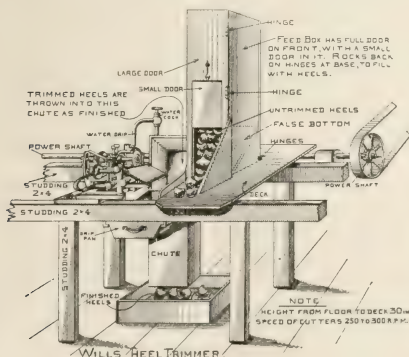
For treads the stock is prepared in the usual manner, and is then sheeted and cut into strips on a calender. The rolls of stock are taken to the tread room, mounted on a let-off, and carried through a stripping mechanism by which the rubber is separated from the liner. After passing over the

driven roller at the top of the machine, the rubber strips make a quarter turn and pass down over idler rollers through chutes, which guide them to the center of a series of iron rollers running on a belt. The widest strip is first rolled on, then the next widest and so on until the required number have been plied up for the tread. By this method of laying each tread separately, all possible entraining of air is prevented, and a more uniform tread is obtained. [Birmingham Iron Foundry, Derby, Connecticut.]

INSTALLATION OF WILLS' OVERFLOW TRIMMER.

The perspective sketch illustrated herewith shows how the Wills' overflow trimmer (described in THE INDIA RUBBER WORLD, July, 1915, page 544) should be installed to gain an increase of 20 per cent in speed and output on such articles as heels, soles, valves, etc.

The feed box, the trimmer, and the chute for the finished heels are so arranged that the operator can readily take the



heel from the feed box, trim it on the rotary shears and drop it into the chute. Thus the cycle can be completed without lost motion or time by the operator.

As many as 3,000 pairs of heels per day can be trimmed by the machine set up in this way, whereas, by hand, an experienced operator can trim less than 1,000 pairs per day. [A. J. Wills, North Brookfield, Massachusetts.]

MILLER'S BOOT AND SHOE REPAIR VULCANIZER.

This vulcanizer is apparently capable of doing almost any sort of repair job, from leaky water bottles to bicycle tires. Specifically, the manufacturers recommend this machine for repairing footwear, footballs, hot water bottles, inner tubes and single tube tires.

The platen that carries the various clamps, plates and special appliances is mounted on a strongly built frame, supporting the gasoline-heated boiler which is provided with a steam gage, water gage, safety valve and a fuel tank.

At the left is a steam-jacketed cylinder for repairing circular surfaces, and a plate, curved to receive any size boot or shoe sole, is cast on the back of the platen. The device for repairing heels is

next to the curved sole mold, and the upright projection is an inside boot or shoe mold specially adapted for inside curing on repairs that are so tedious by other methods. There is a flat surface (6 x 10 inches) for vulcanizing, at one time, from three to six tubes for automobiles or motorcycles, and in addition there is one sectional bicycle mold for repairing bicycle tires. [Charles E. Miller, Anderson, Indiana.]

A MAGNETIC SEPARATOR PULLEY.

This is designed to remove pieces of iron and steel from powdered rubber waste.

The device consists of two pulleys mounted on a steel I-beam frame with a conveyor belt running over them. One is a split pulley of ordinary construction. The other is the magnetic pulley, which is composed of electro-magnetic windings on steel bobbins, placed between and doweled to steel discs keyed to the shaft. The coils of the standard pulleys are wound for 110 and 220-volt direct current, and are connected in series. The terminals are brought through a hole in the center of the shaft to a pair of collector rings placed beyond the bearings. These magnetic pulleys are regularly made in sizes from 12 to 30 inches in diameter.

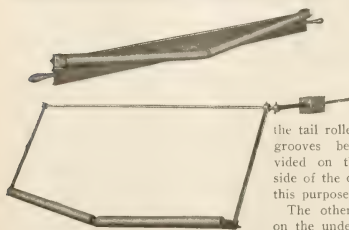


The electric current passing through the coils converts the pulley into a powerful electro-magnet, which attracts and holds any pieces of iron or steel contained in the rubber waste that is being carried along on the conveyor belt. As the normal speed of this belt is 100 feet per minute, the waste and fiber are shot off into a box as the belt turns around the magnetic pulley. The iron and steel pieces adhere to the belt until they pass under and beyond the pulley, when, losing the magnetic attraction, they drop into another box under the belt. [Cutler-Hammer Clutch Co., Milwaukee, Wisconsin.]

ANTI-WRINKLING DEVICE FOR SPREADERS.

To prevent wrinkling of the cloth while it is passing through the spreading machine, the following devices are of interest:

The one shown first in the illustration is used on top of the machine and rests on the pipe coil directly in front of



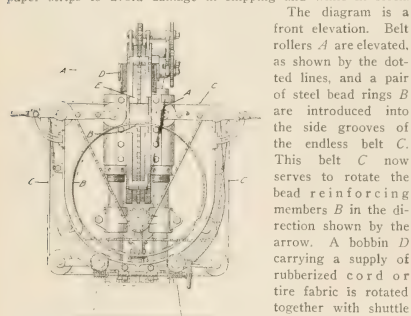
the tail roller, special grooves being provided on the under side of the device for this purpose.

The other is used on the under side of the spreading machine. It is attached under the frame several feet ahead of the wind-up roller. The cloth runs under the angle rollers and the proper tension is gained by the movable counterweight on the projecting arm. [The American Tool & Machine Co., Boston, Massachusetts.]

MACHINERY PATENTS.

A UNIVERSAL TIRE BUILDING AND WRAPPING MACHINE.

HARRIS has invented a universal wrapping machine designed to make cord tires, frictioned fabric tires, to cloth-wrap tires for open curing and, finally, to wrap the finished tire with paper strips to avoid damage in shipping and while in stock.

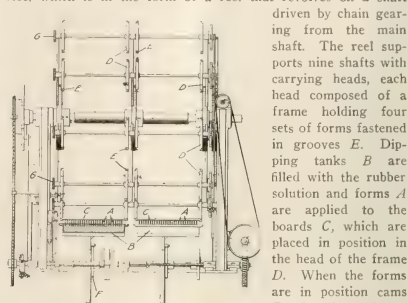


The diagram is a front elevation. Belt rollers *A* are elevated, as shown by the dotted lines, and a pair of steel bead rings *B* are introduced into the side grooves of the endless belt *C*. This belt *C* now serves to rotate the bead reinforcing members *B* in the direction shown by the arrow. A hobbin *D* carrying a supply of rubberized cord or tire fabric is rotated together with shuttle *E*, and the end of the cord is led over tension rolls to one bead ring. When the driving mechanism is started, the shuttle *E* and the bead rings will be rotated in a clockwise direction at varying speeds in interlinked relation, the cord being thus wound in closely adjacent loops over and around both reinforcing bead rings until the entire space is covered by adjacent parallel strands collectively forming a hollow, flat, tube-like, two-ply annular body material for the tire. A repetition of this winding process will produce a four-ply body material built upon the same bead rings, and so on, until any desired number of superimposed layers of rubberized cord or tire fabric have been added. By varying the relative speed of the shuttle and the bead rings, a different angle of applying the cords may be obtained—a feature very desirable in a carcass built up in this fashion. [A. H. Harris, Youngstown, Ohio, United States patent No. 1,160,075.]

DIPPING MACHINE FOR MAKING NIPPLES.

This is Mahoney's newest machine for forming nipples, medicine dropper bulbs, finger cots and similar articles by dipping.

The side elevation shows the more novel features of the device, which is in the form of a reel that revolves on a shaft



driven by chain gearing from the main shaft. The reel supports nine shafts with carrying heads, each head composed of a frame holding four sets of forms fastened in grooves *E*. Dipping tanks *B* are filled with the rubber solution and forms *A* are applied to the boards *C*, which are placed in position in the head of the frame *D*. When the forms are in position cams *F* raise the tanks *B*,

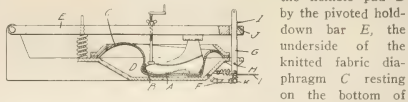
causing the forms to be immersed in the solution to a predetermined depth, after which the tanks recede. Then the pinion *G* is moved through about 140 degrees, and the ratchet mechanism advances the carrying head *D* one step, thus bringing the next set of forms in position over the dipping tanks. When this has been accomplished, the set of forms which have already been immersed have been moved forward about 36 degrees, placing the forms almost vertically above their original positions, thus permitting each deposit of solution to dry.

When a sufficient number of immersions have taken place to produce the desired thickness on the forms, the lowermost dipping board of the frame is removed and a new one inserted. In this way the operation of the machine is made continuous. [J. L. Mahoney, New Haven, Connecticut, United States patent No. 1,160,923.]

BOOT AND SHOE SOLE ROLLING MACHINE.

Instead of using the pressure of a hand-roller in attaching the unvulcanized sole to the bottom of a rubber shoe, Hemenover has invented a machine to do this work.

The sole *A* is applied to the last and is clamped down against the flexible pad *B* by the pivoted hold-down bar *E*, the underside of the



knitted fabric diaphragm *C* resting on the bottom of the chamber *D*. Compressed air is admitted to this chamber through the pipe *F*, and its pressure causes the diaphragm and pad to be wrapped around and pressed tightly against the lower parts of the shoe, thereby causing an evenly distributed pressure on all parts of the sole, which in turn causes the latter to adhere closely to the shoe body. The vertical latch lever *G* holds bar *E* in clamping position and is pivoted to the frame *H*. The teeth *I* on this bar engage abutment *J* on the hold-down bar, thus making it easy to apply the latter to the last.

After the pressure has been left on for a short time, the valve *K* is turned to exhaust the chamber *D*, and a further turning of the handle *L* then automatically releases the last when the extension of this handle engages the lever *G* and releases the hold-down bar *E*. [W. E. Hemenover, assignor to The B. F. Goodrich Co., Akron, Ohio, United States patent No. 1,160,983.]

MACHINE FOR COVERING INNERSOLES OF THE GEM TYPE.

With Hall's new machine, inner soles of the Gem type are finished by pressing the canvas layer into the angle formed by the lip and feather of the inner sole, to produce a smooth and finished inner sole. The novel features are contained in the



drawing which is an enlarged detail in section showing the operating tools, sole and canvas. *A* and *C* are two working tools which cooperate and firmly press together the layer of adhesive cloth *D* and the inner sole *E*, which has a lip *F*. The adhesive cloth is first applied to the inner sole by the Gem machine. A backing tool *B* is used to support the lip *F* and to limit its outward movement. Thus, by not allowing the upper end of the lip free movement, it will not move beyond a predetermined angle in relation to the inner sole.

The tools *A* and *C* are positively rotated and act as feed rollers to feed the inner sole *E*, drawing the canvas over the lip. The tool *B* is made as a disk or wheel and is loosely mounted, to be turned freely by the lip as the inner sole is fed forward by the feed tools and rolls *A* and *C*. The tool *A* is detachably secured to a rotatable shaft *G*, thus permitting a movement of the working tool to or from tools *B* and *C*. By depressing a foot treadle (not shown), tools *B* and *C* may also be moved away or towards tool *A*, thus giving any desired angle to the lip of the sole. [Bicknell Hall, assigned to Panther Rubber Manufacturing Co., Stoughton, Massachusetts, United States patent No. 1,160,711.]

OTHER MACHINERY PATENTS.

UNITED STATES OF AMERICA.

ISSUED NOVEMBER 16, 1915.

- 1,160,364. A machine element. L. H. Backeland, Yonkers, N. Y., assignor to General Bakelite Co., New York, N. Y.
1,160,724. Apparatus for treating coated fabrics. C. J. Laubin, Boston, Mass.

ISSUED NOVEMBER 23, 1915.

- 1,161,044. Means for repairing pneumatic tires. J. R. Gay, Toronto, Ontario, Canada.
1,161,376. Receding pressure gage. B. B. Bristol, Naugatuck, Conn., assignor to The Foxboro Co., Foxboro, Mass.
1,161,414. Portable tire vulcanizer. W. G. Sanford, assignor to Postville Tire Vulcanizer Co., both of Davenport, Iowa.

ISSUED NOVEMBER 30, 1915.

- 1,161,878. Footwear vulcanizing apparatus. E. W. Rutherford, Naugatuck, assignor to Goodyear's Metallic Rubber Shoe Co.—both in Connecticut.
1,161,906. Tire building machine. C. W. Stultz, Indianapolis, Ind., assignor to G. & J. Tire Co., a corporation of New Jersey.
1,161,946. Apparatus for wrapping pneumatic tire casings. T. Midgley, assignor to The Hartford Rubber Works Co.—both of Hartford, Conn.
1,161,967. Tire building machine with shaping tool. T. Midgley, Worthington, Ohio, assignor to Morgan & Wright, Detroit, Mich.
1,161,948. Tire building machine with smoothing arm. T. Midgley, Worthington, Ohio, assignor to Morgan & Wright, Detroit, Mich.
1,161,949. Tire building machine. T. Midgley, Worthington, Ohio, assignor to Morgan & Wright, Detroit, Mich.
1,161,950. Tire building machine. T. Midgley, Worthington, Ohio, assignor to Morgan & Wright, Detroit, Mich.
1,161,951. Apparatus for producing dipped articles. P. I. Murrill, New York, N. Y., assignor to Revere Rubber Co., a corporation of Rhode Island.
1,162,072. Sewing machine tool for tire building machines. W. Kossau, assignor to Morgan & Wright, Detroit, Mich.
1,162,235. Repair vulcanizer. D. S. Hershorn, Chelsea, Mass.
1,162,306. Process of filling tires. E. Oliver, Daytona, Fla.
1,162,360. Apparatus for combining tire threads. H. J. Hoyt, assignor to Morgan & Wright, both of Detroit, Mich.
1,162,380. Hammer for fixing tire threads. T. Midgley, Worthington, Ohio, assignor to Morgan & Wright, Detroit, Mich.
1,162,397. Electric tire vulcanizer. R. B. Price, New York, N. Y., assignor to Rubber Regenerating Co., a corporation of Indiana.
1,162,425. Tire builder's tool. D. A. Wilcox, Garden City, N. Y., assignor to Morgan & Wright, a corporation of Michigan.
1,162,535. Tire repair vulcanizer. C. A. Willey, Battle Creek, Mich.

ISSUED DECEMBER 7, 1915.

- 1,163,053. Heated form for dipped goods. C. S. Williams, New York, N. Y., assignor to Revere Rubber Co., a corporation of Rhode Island.
1,163,089. A mixing mill. H. J. Hoyt, assignor to Morgan & Wright—both of Detroit, Mich.

- 1,163,191. Machine for making pneumatic tires. F. J. Cleaver, Carnegie, Pa., assignor to one-fourth to S. L. H. Morris; one-fourth to H. W. Hodgdon, and one-fourth to E. T. Baron—all of Pittsburgh, Pa.
1,163,388. Sewing machine with a lap rubber cover. H. A. Davenport, Boston, Mass., assignor to United Shoe Machinery Co., Paterson, N. J.
1,163,629. Portable repair vulcanizer. A. B. Low, Denver, Colo.
1,163,707. Apparatus for reclaiming vulcanized rubber waste. C. S. Healey, Rochester, assignor to The Mono Architectural & Engineering Co., Akron—both in Ohio.

UNITED KINGDOM.

ISSUED NOVEMBER 17, 1915.

- 16,627 (1914). Rubber belt fastening. F. Sinclair, 39 Orchard Road, Erdington, Birmingham.
17,110 (1914). Ebonite in insulated electric bearings. C. E. Wieselgreen, 26 Viktoriagatan, Gothenburg, Sweden.

ISSUED NOVEMBER 24, 1915.

- 17,158 (1914). Devices for making rubber corrod golf balls. J. R. Gameter, Portage Path, Akron, Ohio.
17,164 (1914). Rubber strips used with paving blocks. British Murac Syndicate, and M. M. Dessau, 60 London Wall, London.
17,187 (1914). Seam reinforcing strip for bladders, hot water bottles, etc. A. H. Gray, Silverdown, Essex.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

- 476,720 (December 11, 1914). Improved tire making machine. E. Sloper.

THE GERMAN EMPIRE.

PATENTS ISSUED (With Dates of Validity).

- 289,119 (June 30, 1914). Die-press and vulcanizing apparatus for manufacturing tire casings. Viktoriagatan, Gothenburg, Sweden, Rhode Island, U. S. A. Represented by H. Neubatt, patent-lawyer, Berlin, S.W. 69.

NEW MANUFACTURING PROCESSES.

UNITED STATES OF AMERICA.

ISSUED NOVEMBER 23, 1915.

- 1,161,093. Method of making tires. I. J. Webster, Haverhill, Mass., assignor to Reliance A. C. Co., Inc., New York, N. Y.
1,161,215. Packing. F. A. Headon, assignor to H. W. Johns-Manville Co.—both of Milwaukee, Wis.
1,161,549. Tire tread. T. B. Tiefenbacher, New York, N. Y.
1,161,603. Process of drying colloidal substances. G. B. Bradshaw, Brooklyn, N. Y.
1,161,614. Marking vulcanized rubber articles by a heated die. M. H. Clark, Hartsung-Hudson, N. Y.

Anticipated Patent.

- (U. S. D. C.) The Marks patent No. 635,141 for a process for devulcanizing rubber waste. Held not anticipated and valid. Philadelphia Rubber & Vulcanizing Co., a corporation of Indiana. Reclaiming Works, 225 Fed. Rep. 789.
(U. S. D. C.) 134. Backlund's patents Nos. 954,406, 1,018,385 and 1,037,219 for varnishes. Held not anticipated and valid. General Bakelite Co. v. Nichols, 225 Fed. Rep. 539.

ISSUED NOVEMBER 30, 1915.

- 1,161,965. Treatment of plastic material. R. B. Price, New York, N. Y., assignor to Rubber Regenerating Co., a corporation of Indiana.
1,161,966. Manufacture of vulcanized articles. R. B. Price, New York, N. Y., assignor to Rubber Regenerating Co., a corporation of Indiana.
1,161,967. Method of producing vulcanized plastic articles. R. B. Price, New York, N. Y., assignor to Rubber Regenerating Co., a corporation of Indiana.
1,162,384. Method of making valve packing. F. Y. Nichols, Chicago, Ill.
1,162,396. Anti-slipping and anti-wearing material. R. B. Price, Mishawaka, Ind., assignor to Rubber Regenerating Co., a corporation of Indiana.
1,162,454. Method of manufacturing footwear. M. H. Clark, Hastings-on-Hudson, N. Y., assignor to Goodyear's Metallic Rubber Shoe Co., a corporation of Connecticut.
1,162,479. Method of manufacturing tires. A. H. Harris, Youngstown, Ohio.

ISSUED DECEMBER 7, 1915.

- 1,162,741. Method of manufacturing reinforced air tubes. J. W. Blodgett, Chicago, Ill.
1,163,525. Method of manufacturing rubber articles. T. Gare, New Brighton, England.

UNITED KINGDOM.

ISSUED NOVEMBER 10, 1915.

- 16,359 (1914). Method of covering golf balls. A. C. B. Bell, 17 Lansdowne Crescent, Edinburgh.

ISSUED NOVEMBER 17, 1915.

- 16,626 (1914). Rubber bolting. F. Sinclair, 39 Orchard Road, Erdington, Birmingham.

ISSUED NOVEMBER 24, 1915.

- 17,193 (1914). Process for making rubber articles. R. B. Price, 830 Park avenue, New York, N. Y., U. S. A.

THE GERMAN EMPIRE.

PATENTS ISSUED (With Dates of Validity).

- 288,935 (July 11, 1913). Air tube with fabric lining. Brown Perfection Tube Co., New York City, U. S. A. Represented by Dr. L. Gottschow, patent-lawyer, Berlin W. 8.
288,992 (September 25). Tire casing. Bruno Salzmann, Feldstrasse, 16, Berlin-Steglitz.

The Obituary Record.

JAMES MAPES DODGE.

THE chairman of the board of directors of the Link-Belt Co., Chicago, Illinois, James Mapes Dodge, known to the rubber industry of the United States, died at his home in Philadelphia, Pennsylvania, on December 4, 1915, in the 64th year of his age.

Mr. Dodge was born at Waverly, New Jersey, his grandfather being Professor James J. Mapes, his mother Mary Mapes Dodge, well known in literary circles and for a number of years editor of the St. Nicholas magazine. He spent three years at Cornell University and a year at Rutgers College, where, under the late Professor George H. Cook, State Geologist of New Jersey, he took a special course in chemistry. His active work in the business world commenced with a brief engagement at the Morgan Iron Works, New York. He then entered the shops of John Roach, the shipbuilder, at Chester, Pennsylvania, where his marked mechanical ability and ingenuity took him rapidly through the stages of journeyman and foreman to the post of superintendent of erection.

In 1876 he left the shipyard, and after several years' experience in the East, went to Chicago, where he became acquainted with William D. Ewart, inventor of the Ewart Link-belt, with whom and his associates Mr. Dodge entered on the development of the chain belt business.

Later he returned East and, with Edward H. Burr, formed the firm of Burr & Dodge. This partnership resulted in the organization in 1888, of the Link-Belt Engineering Co.

In the planning and arranging of equipment to secure the most economical and efficient handling of products in both the raw and finished state, Mr. Dodge was notably successful; his system of handling coal, in and out of storage, bringing him the Elliott Cresson gold medal of the Franklin Institute of Philadelphia, Pennsylvania.

When it is remembered that while developing inventions on which upwards of 100 letters patent were granted, he at the same time directed the operations of such important corporations as the Link-Belt Engineering Co. and the Dodge Coal Storage Co.—of which companies he was elected president in 1892, to become chairman of the board of directors of the Link-Belt Co., when it was organized in 1906 as a result of the merger of the allied companies—the Link-Belt Engineering Co., Philadelphia, Pennsylvania, the Link-Belt Machinery Co., Chicago, Illinois, and the Ewart Manufacturing Co., Indianapolis, Indiana—some idea of his diligence and versatility may be formed.

Among his designs and inventions were the links and attachments of all link-belt in use, the bushed joint that made the silent chain possible, etc.

With all these activities, he took deep interest in the personal

welfare of his employees and encouraged in them the development of a spirit of ambition and responsibility. Mr. Dodge was recognized as a leader in the various societies and clubs of which he was a member, including the American Society of Mechanical Engineers, of which he was a past president; Franklin Institute, vice-president; Stevens Institute of Technology, Hon. Sc.D.; School of Design, Philadelphia, trustee; Union League Club, Philadelphia; University Club and Zeta Psi Fraternity.

CHARLES H. WILLIAMS.

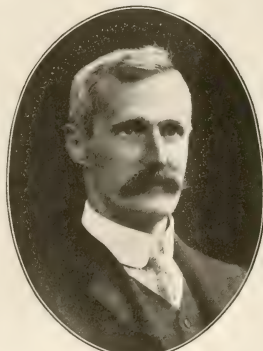
Charles H. Williams, vice-president of the Williams Foundry & Machine Co., Akron, Ohio, died on December 3, at a hospital in Cleveland, Ohio, where he had undergone an operation. Deceased, who came to Akron from Footville, Wisconsin, 12 years ago, engaged in the foundry and machine business with his brother, J. K. Williams. The firm was notably successful in the manufacture of special machinery, molds and dies for rubber manufacturers, including hydraulic and hand presses, patent steam vulcanizers, etc. Lloyd Williams, son of the deceased, is master mechanic for the Williams company.

EDMUND R. HAWKINS.

Edmund Richard Hawkins, for the past four years a partner in the firm of H. A. Astlett & Co., crude rubber dealers and export commission merchants, 117 Pearl street, New York, died

November 30, 1915, at his residence in White Plains, New York.

Mr. Hawkins, who was 45 years of age, was born in India, where his father held an important government post. His early life was spent in Leicester, England, and he was educated at the Leicester grammar school. As a young man he entered the employ of the London & Brazilian Bank, of London, and was first sent out to Lisbon, Portugal, then to Rio Grande do Sul, Para and Manaos, Brazil, where he filled the



E. R. HAWKINS.

position of accountant. Coming much in contact with the crude rubber dealers, he acquired a knowledge of the trade, and ultimately resigned his accountancy to engage in business in Manaos, and later in Para, as a rubber broker. Here he made many friends, by whom he will be remembered with affection and esteem. Keenly interested in athletics, he was often instrumental in diverting the attention of the younger members of the foreign colony from unprofitable pursuits to healthful, outdoor sports and exercise. When he came to New York he left many friends, who greatly regretted the loss of his genial companionship.

Mr. Hawkins possessed a fine tenor voice, and frequently took

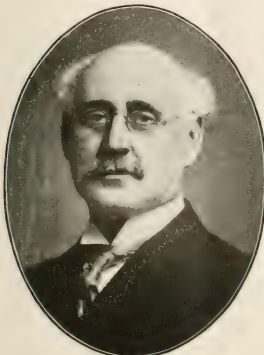
part in musicales and church entertainments at White Plains. He leaves as his immediate family a widow, and two sons, aged respectively, two and seven years, to whom the sincere sympathy of his many friends is extended.

WILLIAM ANDREW CONNER.

William Andrew Conner, first vice-president of the Standard Underground Cable Co., Pittsburg, Pennsylvania, died suddenly at his office in Perth Amboy, New Jersey, on December 6, 1915.

Mr. Conner was born at Baltimore, Maryland, September 12, 1859. He began his business career in Pittsburg in 1876, in the oil refining industry, and ultimately became assistant manager for

the Standard Oil Co. In 1885 the Standard Underground Cable Co. built its first plant in Pittsburg. Mr. Conner took charge, and from that time until his decease, remained at the head of the company's manufacturing business. During this period he planned and supervised the erection of the company's extensive plants at Pittsburg, Pennsylvania; Perth Amboy, New Jersey; Oakland, California, and Hamilton, Canada. Since 1909 he has been vice-president of the Standard



W. A. CONNER.

Underground Cable Co., of which he was a director for ten years. He was also vice-president and a director of the Standard Underground Cable Co. of Canada, Limited, and was actively interested in the organization of the Perth Amboy Trust Co., Perth Amboy, New Jersey, of which he was vice-president.

Mr. Conner had been a resident of Plainfield, New Jersey, since 1904, when he moved there from Pittsburg. He leaves a widow, who was a Miss Tupper, of Michigan; a brother, Edward Conner, of Orange, New Jersey, and a sister, Mrs. Roak, of Brooklyn, New York.

A 32nd degree Scottish Rite Mason and a Knight Templar, a member of the Duquesne Club, of Pittsburg, the Hamilton Club, of Hamilton, Canada, and the Plainfield Country Club, Mr. Conner had many warm friends, by whom he was highly esteemed. The officers and principal employees of the Standard Underground Cable Co. and many friends attended the funeral services conducted at his late residence by the Rev. Dr. Phillip B. Strong, Plainfield, New Jersey, and the Rev. Dr. Lemuel C. Barnes, New York.

A PRIZE SHOW OF RUBBER FOOTWEAR.

With a view to assisting the weather bureau in interesting the pedestrian in rubber footwear, a National Rubber Sole and Heel Week is suggested by the "Boot and Shoe Recorder." The scheme is to devote the week of January 3-11 to a publicity campaign on behalf of rubbers, rubber boots, rubber heels and soles, and similar rubber devices for protection against wet feet and eliminating the shock and jar incidental to pounding hard leather shoes on harder pavements. The weather usually prevalent at this period is almost certain to be helpful to the plan and make an attractive window display of rubber footwear timely. Our contemporary offers prizes for the best display made during the period in question.

THE EFFECTS OF THE LOGWOOD EMBARGO.

THE present situation as regards the dyestuff question is an embarrassing one in many lines of industry, and, as is usually the case under such conditions, the rubber trade suffers in some of its manifold classes of production. When the supply of coal tar dyes was cut off through the discontinuance of German commerce the use of logwood, or its extract, partially filled the gap. About the first of last month the British Government declared an embargo and no logwood could be sent out of Jamaica—the principal source of supply—except to British ports. In fact one or two ships were unloaded which were almost ready to sail to the United States, and the last cargo leaving that island for this country was sunk off Delaware breakwater. Textile men, dyers and felt manufacturers held a meeting in New York, and the United States Government was petitioned to use its influence to remove the prohibition, but about the middle of the month the embargo was further extended to include logwood chips and extract, thus further emphasizing the crisis. Several industries must suffer from the almost total absence of these dyestuffs and it is stated that they are so scarce that some mills and dyeing establishments must cancel their orders and shut down.

Several branches of the rubber industry will suffer. The rubber footwear industry will be affected, much textile and felt goods being used in making overshoes and arctics. The felting mills are using logwood dyes and have some supplies on hand. When these supplies are gone they will be forced to rescind their contracts unless the embargo is modified. However, there seems to be a falling off in the demand for arctics, though this may be balanced by a larger demand for high buckle overshoes, which are now being called for in place of rubber boots. Linings for rubber boots are principally of knit goods in light or natural colors, and felt linings are not dyed. Many rubber plants now turning out great numbers of black canvas tennis shoes are likely to be affected.

The manufacturers of mackintoshes use large amounts of cotton, worsted and woolen textiles, and the larger manufacturers are well supplied with these fabrics, though more are contracted for. Prices advanced when the scarcity of aniline dyes became noticeable, and immediately the embargo was placed upon logwood cotton goods in blacks and some colors advanced from 30 to 50 per cent., and woolens and worsteds from 15 to 30 per cent., which must affect prices of garments as soon as present stocks of textiles are exhausted.

Carriage cloths come under the same general conditions. These are mainly of such colors as need aniline or logwood dyes, and prices of treated textiles so largely used in the automobile trade are similarly affected.

The elastic fabric manufacturers will undoubtedly feel the effects of the embargo in the near future. While some concerns purchase their yarns already dyed, one of the largest producers in this country purchases its yarns in the natural color, and has them dyed to order. At present the dyers have large amounts to color and deliver, and are under contract, which will make present advanced costs fall upon the dyers instead of upon the weavers.

It is expected, however, that the British Government will later remove the embargo, or so modify it that our industries may again be placed in as effective a position as they were previous to this latest prohibitory enactment.

District managers of The Fisk Rubber Company, Chicopee Falls, Massachusetts, to the number of about 100, met in conference on December 17 at the Hotel Kimball, Springfield, Massachusetts. The purpose of the gathering was to bring the company's representatives in all parts of the country into closer touch with each other and to discuss important questions of commercial policy. A dinner given by the company to the visiting managers and heads of departments brought the convention to a close.

News of the American Rubber Trade.

FISK RUBBER CO. SECURES CONTROL OF THE FEDERAL RUBBER MANUFACTURING CO.

CONTROL of the Federal Rubber Manufacturing Co., Milwaukee, Wisconsin, has been purchased by the interests of the Fisk Rubber Co., Chicopee Falls, Massachusetts, which will in future direct the policies of the first named corporation.

Byron G. Douse has disposed of his holdings of Federal stock and resigned as president and general manager of the company. At a meeting of the stockholders, directors were elected as follows: H. T. Dunn and J. A. Kepperley, Toledo, Ohio; B. H. Pratt, H. A. Githens and R. C. Ward, Milwaukee, Wisconsin; and H. G. Fisk, E. H. Broadwell, G. A. Ludington and E. N. Bogardus, Springfield, Massachusetts. The directors elected officers as follows: H. T. Dunn, president; B. H. Pratt, vice-president and general manager; H. A. Githens, assistant general manager; H. G. Fisk, treasurer; R. C. Wood, secretary and assistant treasurer; E. M. Bogardus, comptroller.

This acquisition of the Federal plant by the Fisk company is of considerable interest to the trade. The Fisk plant at Chicopee Falls, comprising some 29 acres of floor space, is said to be the largest exclusive pneumatic tire making plant in operation. The Federal company, in addition to pneumatic and solid tires, manufactures general mechanical lines, such as baby carriage tires, hoof pads, rubber heels, matting, etc. Its plant is located at Cudahy, Wisconsin—a suburb of Milwaukee—and comprises five acres of floor space.

The two organizations will be conducted separately, in both manufacturing and selling departments, the efforts of the Federal organization being especially directed towards building up and developing the jobbing and mechanical lines.

RUBBER COMPANY DIVIDENDS.

The quarterly dividend of \$2 per share has been declared by the Boston Belting Co., Boston, Massachusetts, payable January 1, 1916.

The quarterly dividend of 1¼ per cent on the preferred stock of the Goodyear Tire & Rubber Co., Akron, Ohio, has been declared, payable January 1, 1916, to holders of record December 20, 1915.

The Firestone Tire & Rubber Co., Akron, Ohio, has declared a quarterly dividend of 1¼ per cent on preferred, and 5 per cent on common stock, payable January 15, 1916.

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of the shares of rubber manufacturing companies on November 7 last are furnished by John Burnham & Co., 31 Nassau street, New York, and 41 South La Salle street, Chicago:

	16d	Asked.
Alax Rubber Co., new.....	70	70½
Firestone Tire & Rubber Co., common.....	690	705
Firestone Tire & Rubber Co., preferred.....	112	112
Goodrich Co., The B. F., common.....	74½	76
Goodrich Co., The B. F., preferred.....	112	112½
Goodyear Tire & Rubber Co., common.....	335	338
Goodyear Tire & Rubber Co., preferred.....	114	114
Kelly-Springfield Tire Co., common, old.....	297	298
Kelly-Springfield Tire Co., common, new.....	74	75
Kelly-Springfield Tire Co., 1st preferred.....	95	98
Kelly-Springfield Tire Co., 2nd preferred.....	72½	74
Miller Rubber Co., common.....	235	243
Miller Rubber Co., preferred.....	112	114
Portage Rubber Co., common.....	..	..
Portage Rubber Co., preferred.....	..	..
Rubber Goods Manufacturing Co., preferred.....	..	..
Swinehart Tire & Rubber Co., common.....	87	90
United States Rubber Co., common.....	53	53½
United States Rubber Co., preferred.....	109	110

NATIONAL ASSOCIATION OF WASTE MATERIAL DEALERS.

The various divisions of the National Association of Waste Material Dealers held meetings at the Hotel Astor, New York, on December 14 and 15. The meeting of the members of the Scrap Rubber Dealers' Division was to have been held on the 15th, but the inclement weather interfered with travel to such an extent that there were not sufficient members on hand to constitute a quorum, and the meeting was deferred until the following month.

RUBBER DEALERS BUY A RAILROAD.

Theodore Hofeller & Co., Buffalo, New York, dealers in old rubber and metals, acting in conjunction with C. A. Finnegan, of that city, and A. Weber, of Louisville, Kentucky, have purchased, from the bondholders' committee, the Buffalo & Susquehanna Railway, the purchase price being quoted at \$800,000. The property includes right of way, tracks and stations of an 80-mile steam railway, from Buffalo to Wellsville, New York, with rolling stock, etc., and some valuable real estate, including a 25-acre plot, fronting on the inner harbor at Buffalo, with 2,000 feet of dockage space. It is the present intention of the purchasers to continue the operation of the road.

RUBBER TRADE INQUIRIES.

143. A new American rubber specialty company desires the name of a manufacturer of coloring or ink, such as is used for printing advertising toy balloons.

144. A correspondent wishes to be placed in touch with manufacturers of collapsible tubes and tube-filling machines.

145. A New York export house desires to secure the agency in Spain for rubber collars and cuffs.

146. A dealer in rubber goods desires names of manufacturers of metal shut-offs for fountain syringes.

147. A correspondent in Denmark desires names and addresses of manufacturers of valves for inner tubes for use in bicycle, motor and auto tires.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A Brazilian firm wishes to communicate with manufacturers of suspenders, garters and other articles. Report No. 19,303.

A man in the United States desires samples and prices on rubber heels and other articles for firms in Uruguay. Report No. 19,340.

A man in Norway wishes to establish commercial relations with manufacturers of machinery for making pneumatic automobile and cycle tires and tubes. Report No. 19,341.

A company in France desires catalogs, prices and terms for sole agency of caoutchouc articles for medicinal use. Report No. 19,371.

A man in France desires to represent American firms manufacturing rubber sponges, garden and fire hose, pipes in hard rubber or vulcanite, and other articles. Report No. 19,397.

The agency of American manufacturers of rubber goods and other supplies is desired by a man in Mexico. Report No. 19,407.

A man in Brazil wishes to represent manufacturers of rubber goods, toys and chemicals. Report No. 19,414.

A man in South Africa desires catalogs and full information from American manufacturers regarding machinery for fiberizing, spinning and weaving asbestos for fabrics made from this product, with a view to installing such machinery. Report No. 19,604.

A firm in Argentina desires to represent American manufacturers of rubber goods and other lines. Report No. 19,629.

PERSONAL MENTION.

An American contemporary speaks thus pleasantly of the editor of this paper: "Henry C. Pearson, editor of THE INDIA RUBBER WORLD, has been elected a Fellow of the Royal Geographical Society, London, an honor to which he is fully entitled, for the many investigations he has made in rubber-producing countries on four continents. Mr. Pearson well deserves this distinction, though, being a modest man, it is probable that he will refrain from adding F.R.G.S. to his signature."

B. T. Morrison, formerly at the head of the Reading Rubber Mills, Reading, Massachusetts, who has been quite ill, has so far recovered that he has gone to his winter home in Pasadena, California.

On Tuesday, December 28, Clarence H. Low, secretary of the U. S. Rubber Reclaiming Co., Inc., was married to Miss Madeline Mayer at the home of the bride's parents, the Hotel Blackstone, Chicago, Illinois. Mrs. Low is the daughter of Mr. and Mrs. Levy Mayer, a graduate of Smith College ('14) and an enthusiast in outdoor sports. Her father is a prominent corporation attorney. The happy couple will tour California and Hawaii, after which they will make their home in Westchester County, New York.

L. K. Rittenhouse, who has been connected with the Diamond and Goodrich rubber companies for the past ten years, in charge of a number of their branch-houses, resigned as manager of the St. Louis, Missouri, branch of The B. F. Goodrich Co. on December 31. It is stated that he is returning East.

R. J. Evans has resigned as president and general manager of the Franklin Manufacturing Co., Franklin, Pennsylvania, to become vice-president of the Perfection Tire & Rubber Co., Fort Madison, Iowa.

L. H. Taylor, formerly salesman at the Denver, Colorado, branch of The B. F. Goodrich Co., has been appointed Western manager for the New Jersey Car Spring & Rubber Co., with headquarters at Denver.

F. Haskell Smith, for the past four years factory superintendent of the plant of the Federal Rubber Manufacturing Co., Milwaukee, Wisconsin, has severed his connections with this company. He has not as yet announced his plans for the future.

Antonio Parra, vice-president of the Venezuela Trading Co., Ciudad Bolivar, was in New York recently and reported that 1,200 men were employed by his company in gathering balata and gum chicle from the Bajo Orinoco and the river Yuruari, Venezuela.

George S. Miller, formerly connected with the American Rubber Co., has been appointed manager of the footwear department of the United States Rubber Export Co., Limited.

Edgar B. Davis, vice-president, in charge of the General Rubber Co.'s plantations in Sumatra, recently presented to Colonel Samuel P. Colt an ivory tusk taken from an elephant killed on one of the company's estates. The tusk has been beautifully polished and bears a gold cap with the following inscription:

Colonel Samuel Pomeroy Colt, Serbangan Estate, H.A. P.M., 1914.

The other tusk taken from this same elephant was presented to one of the native sultans of Sumatra.

Commodore E. C. Benedict, on his yacht "Oneida," with a party of friends reached Havana, Cuba, on December 17. Next day the "Oneida" party, as guests of President Menocal of the Cuban Republic, went on a fishing trip along the north coast.

Dr. Frederic Dannherth, well known to the rubber trade, is now in California on a business trip. He will remain at the Coast a month or more.

Charles Howard Newman will represent Pell & Dumont, crude

rubber brokers; 68 Broad street, New York, as salesman, after January 3.

Bertram G. Work, president of The B. F. Goodrich Co., returned from Europe December 22, 1915, on the Rotterdam.

A. G. SPALDING & BROS. NEW OFFICERS.

A. G. Spalding & Bros., New York, have elected First Vice-President J. Walter Spalding, president, to succeed the late Albert G. Spalding. He is succeeded by Second Vice-President J. W. Curtis. H. B. Spalding, son of the newly elected president and formerly counsel to the company, and G. A. Phelps, who has for years had charge of the firm's Eastern branches, have been elected vice-presidents. C. S. Lincoln, formerly in charge of the company's Western branches, with headquarters in Chicago, is now secretary, and W. T. Brown, for many years treasurer of the concern, has been re-elected to that office.

GROWTH OF A RUBBER MILL SUPPLY BUSINESS.

WHEN S. J. HOGGSON started in business in New Haven, Connecticut, as a die-sinker and engraver in 1849, he probably had no idea that his enterprise would develop into an important rubber mill supply business. But his work was in demand by rubber goods manufacturers, and his trade grew with the rapid expansion of that industry. In 1879 he formed a partnership



PLANT OF HOGGSON & PETTIS MANUFACTURING CO.

with George C. Pettis, with the firm name of Hoggson & Pettis, which, as it continued to expand, was incorporated in 1882 as The Hoggson & Pettis Manufacturing Co. The firm has always made a specialty of engraving and die-sinking for rubber manufacturers, and of the supply of such small tools as they use, and the business has grown to large proportions, as the accompanying illustration of the New Haven plant will show.

THE PANTHER RUBBER MANUFACTURING CO.

IN 1904, Frank Berenstein and Miah Marcus, formerly of the sales force of the Foster Rubber Co., Boston, Massachusetts, at the suggestion of some of their customers, started, at Trenton, New Jersey, the manufacture of rubber heels, under the trade name of "Panther." Soon afterward, William Bernstein was admitted to the business, which was ultimately incorporated as The Panther Rubber Manufacturing Co., with Frank Berenstein as president; Miah Marcus, vice-president, and William Bernstein, treasurer—offices they still retain.

The company prospered from the start, and by 1912 the demand for its product had assumed such proportions that its accommodations were inadequate and it eventually located in the plant at Stoughton, Massachusetts, which the Plymouth Rubber Co. had shortly before vacated. Since the removal to Stoughton, the company's business has continued to expand, the original 75 hands, with four in the office, having been increased to a working force of about 200, and it requires an office force of 12 to handle the business. Several large additions have also been made to the plant, in spite of which, night and day work has been necessary to keep up with the orders. A new power plant was added, but only recently a new engine had to be installed, with new machinery, that more than doubled the output, which now amounts to 2,000 to 3,000 pairs of heels per day.

The demand for the company's goods in Canada showing a consistent development, it was determined to manufacture in that country, and in 1914 a plant was established at Sherbrooke, Quebec, Canada, which now supplies the Canadian trade with the same goods that are made at Stoughton.

The company manufactures Panther Tread, Indian, Elwell, Surety and Yankee rubber heels, special heels for the shoe manufacturing trade, rubber soles, rubber soling and rubber molded specialties, the goods being sold extensively by a staff of twelve salesmen, throughout the United States, Canada, Cuba, Porto Rico, Central and South America and the Far East.

ANNUAL MEETING OF THE S. A. E.

The Society of Automobile Engineers will hold their annual meeting January 5 and 6, 1916, at the Engineering Societies Building, 29 West Thirty-ninth street, New York.

Members and guests, including ladies, are requested to register promptly on arrival in the city. The registration bureau will be open Wednesday and Thursday. Upon registration, badges, programs and papers will be supplied.

A session of the Standards Committee will be held in the rooms of the Society, January 4, at 9:30 A. M.

A Business and Standards Session of the Society will be held, January 5, at 9:30 A. M.

Professional sessions of the Society will be held, January 6, at 9:30 A. M. and 12:30 P. M. in the auditorium. The president's address will be delivered at the beginning of the Thursday morning session.

The members will be glad to learn that the annual dinner and entertainment will take the form of the gala occasions of 1913 and 1914, and will be held at the Hotel Plaza, Thursday, January 6, at 8 P. M.

TRADE NEWS NOTES.

The Nearpara Rubber Co., Trenton, New Jersey, has recently installed an up-to-date reclaiming equipment which is motor-driven and includes a special drying process. The reclaimed rubber turned out by this company contains a particularly high per cent of rubber, and the product has become very popular with rubber manufacturers.

Charles E. Wood, 24 Stone street, New York, has appreciably increased his office space and force. Mr. Wood, formerly identified with the New York Commercial Co., has been uniformly successful since his retirement from that concern, and among his many present activities is expert examining for a number of manufacturers.

The Continental Rubber Co., New York, has recently removed its offices to the Equitable Building, 120 Broadway. This company, which specializes in guayule, was formerly located at 17 Battery place.

The Loewenthal Co., 37 West Thirty-ninth street, New York, will remove its offices to the Brooklyn warehouse about January 1. The object of combining office and warehouse is the promotion of the company's service to its customers, as the increased facilities for handling, buying and selling will, in the opinion of the executives, greatly enhance the efficiency of "Loewenthal Co. Service" to its trade. The address is 747 Wythe avenue.

The Beacon Falls Rubber Shoe Co., Beacon Falls, Connecticut, has extended its welfare work by building a fully equipped moving picture theater for its employees.

The Omo Manufacturing Co., Middletown, Connecticut, maker of dress shields, won suit brought in the Federal court to restrain another manufacturer from using a similar appearing trade-mark on the same sort of goods. The Omo company's goods are marked "oMo." The other manufacturer used the mark "DMD," written in a way that, in the opinion of the court, decidedly resembled the trade-mark of the Omo company.

At the meeting of stockholders of the Bucyrus Rubber Co., held at Bucyrus, Ohio, December 9, the following officers and directors were elected: P. J. Carroll, president; George Donnenwirth, vice-president; Anson B. McVay, secretary; W. A. Blicke, treasurer; Col. C. W. Fisher, A. G. Stoltz, H. A. Paxton, M. R. Lewis, Jacob Colter.

The General Electric Co., Schenectady, New York, is erecting a one-story factory addition, 60 x 208 feet, which will cost \$25,000. C. F. Hulth is superintendent of buildings.

A Schrader's Sons, Inc., Atlantic avenue, Brooklyn, New York, has recently added a seven-story building, which adjoins the original factory. The entire plant is constructed of concrete and is conspicuous among the modern factories of Brooklyn.

The Laurel Co., operating at Garfield, New Jersey, has added a line of plumbers' supplies and tubing to its general product of molded goods and erasive rubbers. The general manager of the Garfield company is George Dyer, Produce Exchange Annex, New York.

The plant of the S. & L. Rubber Co., Chester, Pennsylvania, has been sold for \$34,825 to Clark W. Harrison, of the Bloomington Rubber Co., Butler, New Jersey.

As Akron manager for Charles T. Wilson Co., Inc., New York, dealers in crude rubber, L. N. Le Pan has succeeded Henry Perlish.



THE NEW UNITED STATES TRUCK TIRE.

After thorough tests, under the most severe working conditions, on trucks of all kinds and roads of all descriptions, a new truck tire is offered by the United States Tire Company to truck owners as affording the maximum wear under heaviest loads and a degree of resiliency that is not only lasting but which affords the greatest protection to the mechanism of the truck. A new type of hydraulic press is used in vulcanizing this tire, under a pressure of 800 tons, which forces all gas and every atom of moisture out of the rubber. The extreme depth of the dovetailed serrations in the steel base into which the hard rubber compound is forced, and there vulcanized, makes an inseparable union between the rubber foundation and the steel rim.

These advantages, combined with a rubber compound of exceptional toughness and in larger volume than in most truck tires, are features impressed on the truck owner as insuring longer life to tires—the most expensive item in his truck equipment.

The sectional form of the tire is likewise claimed as an improvement on previous patterns, insuring the retention of the shape until the tire is quite worn out, side stripping of the tread being impossible. [United States Tire Co., New York.]

PERSONAL MENTION.

Jesse E. La Dow, as representative of the Mansfield Tire & Rubber Co., Mansfield, Ohio, has been appointed chairman of the press and publicity committee of the Ohio Manufacturers' Association. Mr. La Dow presented a report at the fifth annual meeting of the association held at Columbus, Ohio, on December 14.

John W. Conway, superintendent of the Bridgeport, Connecticut, branch of the Polack Tire & Rubber Co., New York, is making an extended trip abroad, to investigate conditions as related to the English and German factories of the Polack company.

Charles E. Ross has been made manager of the Columbus branch of the Midgley Tire & Rubber Co., Lancaster, Ohio.

At a meeting of the Board of Directors of the United States Tire Co., New York, held December 15, Ernest Hopkinson, patent counsel of the United States Rubber Co., was elected vice-president and a member of the executive committee of the United States Tire Co.

George B. Hendrick, of Winthrop, Massachusetts, has been appointed manager of the newly established publicity department of the Fisk Rubber Co., Chicopee Falls, Massachusetts. In addition to publicity matters, he will have charge of printing and will edit the company's house organ, but the new department will have no connection with the advertising department, the management of which remains unchanged. Mr. Hendrick is well known among newspaper and advertising men of the East, having been, successively, advertising manager of the Boston "Traveler and the Pittsburgh "Post" and "Sun," and sales manager of the A. Muford Corporation, of Hartford, and of the George H. Ellis Co., of Boston. He goes to the Fisk company from the latter concern.

Arthur E. Friswell, who returned to the United States early last summer after several years' stay in Bermuda, as recorded in THE INDIA RUBBER WORLD of June 1, 1915, is to engage again in the tire manufacturing business. He has accepted a position with the Northern Rubber Co., Retford, Nottinghamshire, England, to reorganize and extend the business of its Sheffield branch in the engineering machinery and colliery districts of the North of England.

The Michelin Tire Co., Chicago, Illinois, informs us of the advancement of R. B. Tracy, formerly central manager, to the position of factory representative, with supervision over the following branch territories: Philadelphia, Cleveland, Chicago, St. Louis, Des Moines, Kansas City and Minneapolis.

TRADE NEWS NOTES.

In a circular letter, dated December 1, 1915, Ewart M. Brunn announces the dissolution, by mutual consent, of his partnership with Paul Bertuch, under the firm name of Hagemeyer & Brunn, and that the business will be continued by him, at the same address, 9 Stone street, New York, under the same firm name. Paul Bertuch, under the same date, announces his intention to continue in business as a rubber merchant, under his own name, at 25 Beaver street, New York.

A meeting of the American Society for Testing Materials, Committee D-11 on standard specifications for rubber products, was held in New York, December 14, 1915.

The directors of the Canadian Connecticut Cotton Mills, Limited, Sherbrooke, Quebec, Canada, have authorized a large addition in the equipment, doubling the production of the mill. Additional buildings will also be erected. Although the consumption of tire fabric in Canada has heretofore been insufficient to warrant this expansion, evidence of an era of better times now leads the company to anticipate conditions and prepare for more economical operation.

Fire broke out in the plant of Julius Schmid, manufacturer of druggists' sundries at Long Island City, New York, on the night of December 10, 1915, the three-story frame building and entire contents being totally destroyed, with a loss of \$20,000, fully covered by insurance. The flames spread to the residence of C. F. Schmid, secretary of the company, adjoining the factory, and this, with its contents, was also destroyed.

The L. H. Butcher Co., San Francisco and Los Angeles, California, will act as selling agent on the Pacific Coast for Katzenbach & Bullock Co., New York, Chicago and Trenton. The latter concern imports and deals in chemicals, colors and compounding ingredients, making a specialty of supplying the requirements of rubber manufacturers in these materials.

At a meeting of the board of directors of the Rubber Goods Manufacturing Co., Jersey City, New Jersey, held on December 1, 1915, the regular quarterly dividend of 1 1/4 per cent on the preferred stock was declared, payable December 15 to stockholders of record December 10.

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, announces the payment on January 1, 1916, at the office of the Guaranty Trust Co., of New York, 140 Broadway, of the convertible sinking fund five per cent gold bonds of the company, issued and outstanding, under the trust indenture of March 30, 1906. Holders of the bonds who wish to anticipate said date of redemption, may surrender them for cancellation at the above address and will receive, in cash, the face value of their bonds, with a premium of five per cent and interest on such face value at the rate of five per cent per annum, from July 1, 1915, to the date of surrender.

The Converse Rubber Shoe Co., Malden, Massachusetts, has established a western sales department in Chicago, Illinois, with Morton L. Paterson, well known in shoe trade circles, as manager. Premises at the corner of Peoria street and West Jackson Boulevard have been leased for the purpose.

ROBERT BADENHOP, RUBBER DEALER, RETIRES.

The firm of Robert Badenhop, dealers in crude rubber, at 67-69 Wall street, New York, enters into liquidation January 1, 1916, the head of the firm, Mr. Badenhop seeking rest and recuperation of his health, overstrained by close attention to business. The interests of the firm will be transferred to a new corporation, organized for this purpose, of which H. W. Holcombe and Sloan Lamont, Jr., will have the active management. They have both been associated with Mr. Badenhop for several years and are well known in the trade. The title of the new concern will be the Robert Badenhop Co. The offices will remain at the same address and the branch office in the Second National Building, Akron, Ohio, will also be maintained.

TRADE NEWS NOTES.

On application of the president, Wilmer Dunbar, a receiver has been appointed for the Dreadnaught Tire & Rubber Co., Baltimore, Maryland. President Dunbar states that the receivership is only temporary and will in no way interfere with the company's business. Eli Frank has been named as ancillary receiver. The company is a Delaware corporation with \$1,000,000 capital stock.

Music enters conspicuously into the "social uplift" at the Morgan & Wright branch of the United States Tire Co., Detroit, Michigan. With the aid of a player-piano, donated by the corporation, and the musical talent that appears to be well represented in the working force, a daily vocal and instrumental concert is given during the noon hour in the dining room, patronized by some 2,000 employees.

The Cleveland-Ford Tire Co.'s new plant at Ashtabula, Ohio, is reported as progressing steadily. All the foundations are complete, and work will go on rapidly. The main building will be 73 x 182 feet, two stories high, of reinforced concrete with brick facing. Provision will be made for its extension and the addition of a vulcanizing plant. A separate building will accommodate the company's several offices, but an office will also be retained in Cleveland, Ohio.

The Bowers Rubber Works, San Francisco, California, is equipping its plant at Pittsburg, California, with an outfit for making automobile tires.

Toledo Tire & Supply Co., Toledo, Ohio, is enlarging its present store facilities, and will put in a modern multiplex display system.

Leigh-Peck Tire & Rubber Co. will occupy a new building nearing completion on Second avenue, Cedar Rapids, Iowa. The company will handle exclusively the products of the Firestone Tire & Rubber Co., Akron, Ohio, and will control their sale in eight counties adjacent to the city.

UNITED STATES TIRE CO.'S CONVENTION IN DETROIT.

Four days of tire enthusiasm marked the gathering of the salesmen and branch managers of the United States Tire Co., assembled at Detroit, Michigan, during the week ending December 18, 1915, for their regular convention. The tire company's Morgan & Wright plant was the place of meeting, and there J. Newton Gunn, recently chosen president of the company, made the acquaintance of the members of his selling staff, gathered to the number of about 400, from all parts of the country, in spite of storms and snowdrifts.

The convention assembled in Building K of the plant, and among the many interesting addresses, technical or otherwise, C. B. Whittlesey, vice-president of the Hartford Rubber Works Co., read a paper on "The History of Rubber," and Factory Manager McMahan spoke on "How Tires Are Made."

The social features of the convention proved thoroughly enjoyable. They included a business dinner at the Hotel Pontchartrain, and a banquet at the hotel on Friday evening, at which many of the automobile manufacturers were present as guests.

THE GOODRICH "BAREFOOT" TIRE.

A new Goodrich tire has been christened the "Barefoot" and is recognizable by its black tread. This tread or sole of the new tire is made of "hyper-rubber," a compound evolved by The B. F. Goodrich Co., Akron, Ohio. This hyper-rubber tread has a certain amount of stretch, between the outer surface contact with the ground and the inner surface, which is cemented to the cotton fabric. This stretch or "spring," it is claimed, reduces the grind, the frictional heat and wear, between tire and roadway, that is so severe on tires. It is described as lessening the strain on the rubber layers between the fabric occasioned by starting or stopping suddenly. Maximum traction with minimum friction is what the new tire stands for and the manufacturers expect it to result in maximum mileage from every ounce of material used.

EXPANSION OF THE FISK RUBBER CO.'S PLANT.

The Fisk Rubber Co., with the completion of the new buildings in course of construction, will have in its plant at Chicopee Falls, Massachusetts, 29 acres of floor space devoted to the manufacture and distribution of tires. With the completion of the exterior construction, a fair idea may now be obtained of the magnitude of the plant. The new administration building, of stone, steel and tapestry brick, is 50 x 200 feet, and seven stories high; the new mill building of brick and steel, 108 x 60 feet, has five stories and basement; the new storehouse, of reinforced concrete and steel, with brick panels, 108 x 300 feet, has five stories and basement, and there is also a new garage and service station, 60 x 100 feet, with separate accommodations for private cars and trucks. The administration building is unusually complete as to arrangement, equipment, etc. It contains more than 50 office apartments, rest rooms, three dining rooms that will accommodate 200 people, kitchens, refrigerating and ice-making apparatus, etc. With the recent additions, the plant will comprise 20 separate structures, and the output of tire casings alone will be increased to 12,000 per day.

KELLY-SPRINGFIELD REDUCES PAR VALUE OF COMMON STOCK.

At a special meeting of stockholders held in Jersey City, New Jersey, on November 30, the Kelly-Springfield Tire Co., New York, authorized a reduction in the par value of the common stock from \$100 to \$25 a share. This will increase the number of shares outstanding four times. Holders of new common stock will be entitled to one vote for each share of \$25 par value, and, in order to equalize the voting power of common and preferred, the preferred stockholders will have four votes for each \$100 share.

Quarterly dividends of $1\frac{1}{2}$ per cent on the 6 per cent preferred stock and $1\frac{3}{4}$ per cent on the 7 per cent second preferred stock have been declared, payable January 3, 1916, to stockholders of record December 15, 1915.

TO MAKE CRATES FOR TIRE SHIPMENTS.

There is a large demand for crates made of hardwood, for the shipment by freight, or express, of rubber tires. Two of the leading concerns engaged in their manufacture as a specialty, The Steele Bros. Lumber Co., Cuyahoga Falls, Ohio, and the Alderfer Crate Co., Sharon Center, Ohio, have recently combined to form a new corporation, the Steel-Alderfer Co., with a capital of \$50,000. Both companies formerly did a large business with tire manufacturing concerns all over the country, especially those at Akron, Ohio, and the recent destruction by fire of the Alderfer plant made the combination timely and judicious. A large and completely equipped manufacturing plant, of fireproof construction and more than double the capacity of the two former plants, will be erected at Cuyahoga Falls to handle the joint business of the combined companies.

SANITARY SUPERVISION FOR FISK RUBBER CO. EMPLOYEES.

The conservation of the health and hygienic welfare of employees as an important factor in business success, has led the leading rubber manufacturing concerns to devote constantly increasing attention to this important subject. The Fisk Rubber Co., Chicopee Falls, Massachusetts, which is adding extensively to its plant, has not overlooked this important point. Dr. William Hall Coon has been placed in charge of the department of industrial hygiene that will look after the health of the army of Fisk employees. Dr. Coon is admirably fitted by experience and professional ability for this important position. For upwards of eight years he was connected with the State Board of Health as district health officer, during part of the time in charge of one of the most populous districts in the State, where he was constantly in touch with industrial conditions. In supervising remedial and prophylactic work and sanitation at the Fisk plant, he will find a wide field for the exercise of his ability as a physician and in an executive capacity, and the company is to be congratulated on being able to secure his services for this important work.

TRADE NEWS NOTES.

During the past year the McGraw Tire & Rubber Co., East Palestine, Ohio, has established both pneumatic and truck tire branches in most of the principal cities of the United States. The most recent addition is at Detroit, Michigan, located in the Dime Savings Bank Building, and is under the supervision of G. W. Tiffany, formerly with the Gibney Tire & Rubber Co.

The Brooklyn, New York, branch of the Firestone Tire & Rubber Co., Akron, Ohio, will remove soon after January 1 to a building at Sterling Place and Bedford avenue, recently purchased from the Ford Automobile Co. The building will be utilized solely for the distribution of Firestone goods for Brooklyn and Long Island. A portion will be used as a service station, with a complete shop equipment for the repair and application of solid motor truck tires.

The Eastern Rubber Co., 1529 Ridge avenue, Philadelphia, Pennsylvania, which has been experimenting for some time, announces that a compound that makes a perfect inner tube joint, without the use of acid or heat, has been perfected.

An issue of \$850,000 in 7 per cent preferred stock of the Goodyear Tire & Rubber Co. of Canada, Limited—a subsidiary of the Goodyear company of Akron, Ohio—has been put on the market for the purpose of enabling the Canadian company to redeem common stock which is owned entirely by the Akron company. This will give the Canadian company greater financial independence, but the business connection between the two companies will still be continued. The Canadian company was organized to overcome the high tariff rates of rubber goods that are in effect between the United States and Canada.

The Schelp-Budke Tire & Rubber Co., St. Louis, Missouri, has recently acquired the agency in Missouri and Southern Illinois for the pneumatic and solid tires of the Victor Rubber Co., Springfield, Ohio.

The Dry Climate Tire Co., Denver, Colorado, intends to establish a branch plant at El Paso, Texas, for the manufacture of casings and inner tubes for automobiles and bicycles.

The Mason Tire & Rubber Co., Cleveland, Ohio, has decided to locate at Kent, Ohio, and will erect a concrete building with a floor space of 30,000 square feet. The estimated cost is \$60,000.

The plant, property and equipment of The Morgan & Marshall Rubber & Tire Co., manufacturer of automobile tires and tubes, was sold on November 30, to J. C. McLean, president of the M. & M. Co., Cleveland, Ohio, by the receivers. The price paid is stated to have been \$47,600. It is expected that the M. & M. Co., which is a supply house, will take up the manufacture of tires.

The McNaull Tire Co., Toledo, Ohio, whose incorporation was mentioned in the December issue of THE INDIA RUBBER WORLD, succeeds the McNaull Auto-Tire Co. The new company proposes to erect larger buildings and employ 1,000 additional men. W. D. McNaull is the president of the company; M. W. McNaull, vice-president; A. B. Laskey, secretary, and Ole Hilmer, sales manager. Mr. McNaull is the patentee of the McNaull boiler, built by the McNaull Manufacturing Co.

The Standard Tire & Rubber Co., with offices in the Hippodrome building, Cleveland, Ohio, and factory at Willoughby, Ohio, is manufacturing a line of tires and tubes with a 5,000-mile guarantee. This is one of the newer companies of the Middle West, and is said to be operated under particularly capable management, as the executive force, factory superintendent, and various heads of departments have had long and successful experience in tire manufacture. The president of the company, Mark Gillen, is well known in rubber circles, having been identified with some of the largest rubber mills of the country for many years.

AN INGENUOUS WINDOW DISPLAY.

A method of displaying goods in a show window that is alike unique, original and calculated to prove profitable to the retailer has been devised by Charles E. Miller, Anderson Rubber Works, Anderson, Indiana. The drum, which we show, is four feet in diameter, octagonal in form, and fills the show window of a 36-foot store, having a display surface of about 432 square feet. The goods are attached to the drum in such a manner as to preserve



REVOLVING WINDOW DISPLAY.

its balance, the figures being so written and displayed as to be plainly legible from outside. Other index figures refer to the bin, etc., in which the article is to be found.

By means of an electric motor, operated from a 16-candle power lighting socket, the drum is slowly revolved, making a complete revolution in about 40 seconds. By this means the display of a large assortment of goods is made possible, while the novelty of the device and the steadily appearing and disappearing lines of goods is certain to attract the attention of the passing pedestrian, with the possibility of its presenting something that he wants.

A CHANGE THAT MEANS EXPANSION.

The Lee Rubber & Tire Corporation, the incorporation of which is noted elsewhere in the present issue of this paper, held a meeting for organization on December 20, 1915, at which officers were elected as follows: President, Albert A. Garthwaite, formerly president of the Lee Tire & Rubber Co., Conshohocken, Pennsylvania; vice-president and chairman of board of directors, John J. Watson, Jr.; assistant secretary and assistant treasurer, William McCaw. The new corporation has acquired all the bonds, and the preferred and common stock of the company it succeeds. The bonds will be retired, and with extra capital, its business in the manufacture of tires, surgical and miscellaneous rubber goods, carried on at its plants at Spring Mill and Conshohocken, Pennsylvania, will be greatly extended, the tire making capacity alone to be increased from 1,500 to 3,000 per day.

GILLETTE SAFETY TIRE CO.'S NEW PLANT.

The Gillette Safety Tire Co., Inc., formerly of Grand Rapids, Michigan, has commenced operations on the erection of a new plant at Eau Claire, Wisconsin. The initial one-story building is to be 60 x 250 feet, of brick and reinforced concrete. It is located and constructed to permit additions being made at any time. The latest improved machinery will be installed, and the initial output will be 100 tires and tubes daily. The company will also manufacture solid tires for trucks and heavy vehicles, and everything in the line of tire accessories. A temporary office has been opened in Eau Claire, with Vice-President H. B. Gillette and Secretary J. S. Wilson in charge.

NEW INCORPORATIONS, WITH AUTHORIZED CAPITAL, ETC., 1915.

Airless Auto Wheel & Tire Co., Inc., The, December 20 (New York), \$10,000. Antonio Martone, Rachele Sciano and J. Russell Bottolteri—all of Rochester, New York. Airless auto wheels and tires.

Ajax Rubber Co., Inc., December 20 (New York), \$5,000.00. Charles E. Lynch, 514 West 182nd street; William J. Jackson, 945 East 18th street—both in New York City; Charles L. Morris, 201 Baldwin avenue, Jersey City, New Jersey. Tires, rubber goods, etc.

Atlas Arabicum Co., Inc., December 1 (New York), \$10,000. J. Blair Cameron and Samuel M. Cameron—both of 49 Broadway; Gustave M. Marcus, 8 Greene street—all in New York City. Rubber and leather goods.

Bond Tire Co., November 12 (Massachusetts), \$100,000. Albert B. Weld, Wilbur M. Doullens—both of 107 Massachusetts avenue, Boston, and Edwin Cook, Danvers—both in Massachusetts. Office, Boston, Massachusetts. To manufacture and deal in tires, tubes, etc.

Bronx Rubber Co., Inc., December 17 (New York), \$5,000. H. K. Halikman, 1209 Bedford avenue, Brooklyn, New York; Isidore Teitlebaum, 446 Westchester avenue, Bronx, New York; and William J. Gannon, 937 East 22nd street, New York City. All kinds of vehicles and motors.

Cassidy Co., Inc., Edward A., December 2 (New York), \$20,000. Edward A. Cassidy, 1022 Pelhamdale avenue, Pelham Manor, New York; George E. Coughlin, 546 Eighth avenue, New York City, and Herbert R. Rising, East Orange, New Jersey. Automobiles, tires, etc.

Lee Rubber & Tire Corporation, December 16 (New York). Robert E. J. Corcoran, 328 Union street, James Gru, 17 Fourth street—both in Brooklyn, New York; Edward Roeder, 366 Teaneck Road, Ridgely Park, New Jersey. Carry on business with \$750,000. Shares of stock having no nominal or par value.

McTernan Rubber Manufacturing Co., November 9 (Massachusetts), \$150,000. August H. Goetting, Springfield; Lawrence F. Sherman, 249 Castle Road, Nahant; Charles S. Johnson, 44 Breed street, Lynn; Andrew McTernan, Andover, and Osborne R. Witter, Swampscott—all in Massachusetts. Office, Boston, Massachusetts. To manufacture rubber goods, tubing, etc.

Marion Tire & Rubber Co., The, October 9 (Ohio), \$15,000. A. J. Berry, W. H. Holverstott, S. B. Lippincott, N. J. Jones, J. L. Price, W. F. Moyer and R. T. Lewis. To deal in tires and accessories.

Miller Tire Corporation, December 24 (New York), \$2,500. Benjamin F. Bogart, Asbury Park, New Jersey; Wilson R. Hunter, 224 West 105th street, New York City, and Miles P. Gordon, 537 First avenue, Astoria, Long Island, New York. Rubber tires of all kinds.

Morong Shoes, Inc., November 12 (New Jersey), \$25,000. Grace C. Morong, 189 Grafton avenue, Newark; David R. Thomson and Benjamin Thomson—both of 85 Park avenue, Paterson—all in New Jersey. To deal in rubbers, etc.

Nelson Truck Tire & Wheel Shop, Inc., November 24 (New York), \$5,000. Lincoln Tyler, 25 Liberty street, Harry D. Nelson and Jesse L. Nelson—both of 173 Lexington avenue—all in New York City. To manufacture autos, tires, etc.

Parker-Wood Manufacturing Co., October 22 (Massachusetts), \$15,000. Edward E. Wood, Jr., Brookline, Arthur S. Brock, 57 Broad street, Boston; George C. Parker, 339 Lincoln avenue, Cliftondale—all in Massachusetts. Office, Boston, Massachusetts. To manufacture and deal in rubber and rubber goods, etc.

Savage Tire Co., November 10 (Oregon), \$1,000,000. Arthur W. Savage (president), John D. Spreckles (first vice-president), Harry L. Titus (second vice-president), Claus Spreckles (sec-

retary), A. J. Savage (treasurer)—all of San Diego, California. Office Main and Sicard streets, San Diego, California. To manufacture and deal in tires, tubes and accessories.

Schafer-Bowlus Tire & Rubber Co., The, November 12 (Ohio), \$10,000. H. B. Schafer, H. D. Bowlus, William J. Lennon, William Schafer, and C. A. Suhr. To manufacture and deal in rubber goods.

Transparent Rubber Works Inc., December 7 (New York), \$5,000. Morris Goldman, 1346 Lyman Place, Bronx, New York; Charles G. Newman, 644 Snediker avenue, Brooklyn, New York, and Herman A. Schoenfeld, 309 Broadway, New York City. To manufacture rubber goods, druggists' sundries, etc.

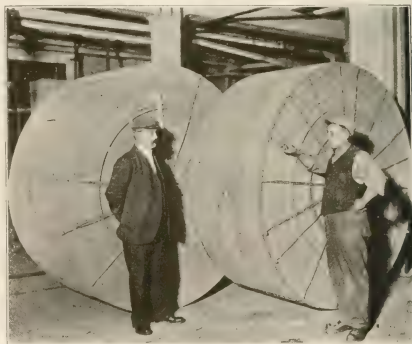
Traveller Tire & Tube Co. of New England, November 18 (Maine), \$150,000. Horace Mitchell (president), H. A. Paul (treasurer), M. G. Mitchell (director)—all of Kittery, Maine. Office, Kittery, Maine. To manufacture and deal in tires, tubes, etc.

Yates Tire Co., Inc., December 20 (New York), \$25,000. R. K. Cavanaugh, Ernest F. Talmitch and Garrett Smith—all of Rochester, New York. General tire business.

Yorkville Waterproof Footwear Co., Inc., December 15 (New York), \$1,000. Benjamin Levy, 1728 Second avenue, Morris Sodickson, 1752 Second avenue—both in New York City, and Sophia Gordon, 515 Gravesend avenue, Brooklyn, New York.

REMARKABLE UNIFORMITY IN TWO BIG BELTS.

The two big belts shown in the accompanying illustration were made by Gutta Percha & Rubber, Limited, Toronto, Canada, as part of the belting equipment of the new Government Terminal Grain Elevator at Vancouver, British Columbia, and are claimed



TWO BELTS MADE IN CANADA.

to be the largest ever made in Canada. A remarkable fact in connection with these belts is the uniformity in manufacture they represent. One, 1,410 feet 8 inches in length, weighs 9,421 pounds; the other, 1,411 feet long, weighs 9,423 pounds—a difference in weight of but two pounds, which the four inches difference in length easily accounts for. Considering that each belt was more than a quarter of a mile long and weighed nearly five tons, this uniformity in weight for length is more than remarkable. That it is not merely fortuitous is proved by the fact that in all the 36-inch, five-ply belting, the variation from the manufacturer's average weight did not exceed one per cent, and in the six-ply, did not exceed two-thirds of one per cent. There were three other belts in the outfit nearly as large as those illustrated, and the total net weight of belting furnished on the contract was 52 tons.

Welfare Work in a Modern Rubber Shoe Factory.

WELFARE work in rubber factories has made great progress in the last few years, perhaps as much as in any other branch of American industry.

Take the Hood Rubber Co., as an example. At its great group of factory buildings at East Watertown, Massachusetts, it employs upwards of 4,500 hands. In March, 1911, a welfare department was established for this army of workers. A hospital was first established and placed in charge of a registered physician and surgeon, a graduated nurse and a secretary. This hospital is furnished with all the most approved appliances for the treatment of sickness, accidents and surgical cases, except what are termed major surgical operations. There is, besides the doctor's office, a prescription department, an eye, ear, nose and throat section, an operating room, a dental department, a hospital ward with two beds, and a rest room with two couches.

The dental department has three chairs and is really a branch of Tuft's College dental clinic, and each forenoon an instructor and three advanced students give their services. The Hood Rubber Co. gives the patients their time, and the patients pay only the cost of the material. In the single year this department has been established, more than 1,000 treatments of extracting, filling and cleaning have been given.

In the hospital more than 10,000 emergency treatments were given the first year, and the number increased to 18,000 last year. Of these, two-thirds were medical and one-third surgical. This department is in charge of Dr. R. S. Quinby, a graduate of Tuft's College and Medical School and of St. Elizabeth's Hospital. Dr. Quinby came here four years ago, as assistant to Dr. Dennen, who instituted the department, and succeeded him at his retirement in July, 1914.

A pulmotor provided for asphyxiation emergencies has never been in service and, fortunately, serious accidents have been rare. Safety appliances have been installed, and special attention has been paid to ventilation, lighting and sanitary arrangements; while new employees are given special instructions as to proper care and caution in their work.

All water for drinking purposes is filtered, purified and cooled, and distributed to fountains installed on all the floors. There are rules regarding expectoration. There are rest rooms on each

floor, and three matrons see that all the sanitary rules are enforced.

Lead poisoning is the most prominent danger in the mill room of a rubber factory. Special precautions are taken to guard against this danger. Exhaust fans are placed over each grinder. The floors are wet down before sweeping, and all employees are cautioned to thoroughly cleanse their hands before eating, or before leaving the factory. Every six months those workmen who come in contact with lead, or other deleterious substances or chemicals, are examined thoroughly for traces of poisoning.

Plans are developing rapidly along social, athletic and educational lines. There are two bowling leagues for men, one of 14 teams and another of 12 teams, and a ladies' bowling league of six teams. At the end of the season the company furnishes prizes and provides a banquet at which these are awarded. In the winter there is arranged an elaborate indoor athletic affair for all of the Hood teams, and in the summer a monster picnic to which all of the employees and their friends are bidden.

A mutual benefit association is carried on by the employees, that provides sickness, accident and death benefits. The company has not interfered with this department, believing it to be of educational value to the workers in developing self-reliance.

The large dining room is also used as a meeting place for the foreign-speaking work-people, where lectures are given in Italian and Armenian languages on American history, citizenship, and other helpful topics. At these meetings an Italian or an Armenian band, composed of workmen in the factory, furnishes music. Stereopticon illustrations usually accompany the lectures.

The indirect result has been better attendance at the evening schools provided by the city, the formation of an amateur dramatic club, and a large number of the foreign born workers have taken out naturalization papers and become American citizens.

The restaurant is a large, well-lighted room with mission tables and seats for two hundred people. The clerical force can obtain at cost a wholesome midday meal prepared in the modern kitchen furnished with the latest up-to-date appliances. The bill of fare is changed each day and the variety comprises appetizing and



OPERATING ROOM, WELFARE DEPARTMENT HOSPITAL.

seasonable dishes. Soups are furnished at 7 cents; cold meats with potatoes, 17 cents; hot roast meats with "fixin's," 23 cents; sandwiches, pies, puddings, tea and coffee, 5 cents.

The restaurant is run on the cafeteria plan (a self-serving system), and employees may purchase a full meal, or any part of a meal from the menu. Those who prefer to bring their lunches are required to eat them in the restaurant, where they have the use of the tables free. This rule is made in order to bring the workers together socially. A secondary result is cleaner offices and less refuse in the waste baskets.



RESTAURANT USED AS LECTURE ROOM.

There is also a private dining room where the heads of departments and the salesmen are served, and where any customers visiting the factory may be invited. Here a course dinner is served. Adjoining this is a rest room with current magazines and the nucleus of a library.

Thus the company is caring for the health and comfort of its employees and the results are mutually beneficial. The workers are healthier and happier, and give more efficient service to their employers.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

EVERY branch of the rubber trade is getting a share of the country's prosperity. In many lines production slows down the last two weeks in the year, but instead we hear of cases where demand is making overtime necessary. The clothing business is one of these, and the leading companies have orders enough ahead to keep them running full time, and also immediate or delayed orders which make full output imperative. Rubber heels and soles are in demand, and one company, at least, is working nights, and even holidays to keep abreast of orders. The mechanical goods people usually slow down the whole month of December, but the month just closed has proved a notable exception. The demand for rubber belting is greatly increased by the tremendous advance in leather belting costs, though this is in part supplied, where applicable, by rope transmission. Druggists' sundries manufacturers are about as busy as usual at this season. They have had good business, but it generally drops off about the first of December, to start up again after the year is really going. Boot and shoe men had an unusual streak of business the middle of the month, when a big snow storm made a consumer's demand which caused the shipping forces of the wholesale houses several nights' extra work.

* * *

As is very generally known, the Stoughton Rubber Co. and the American Rubber Co. are subsidiary to the great United States Rubber Co. Following the newly established policy of

concentration, these two companies have been merged into one big corporation, which will continue to run the rubber clothing factories in Cambridge and in Stoughton, but will consolidate the sales departments into one, centrally located and fully equipped for carrying on the combined business of the two companies. The same officers will manage the business, which is expected to be the most complete, best systematized organization in this line in the United States. The goods will be sold under the same trade brands, namely Stoughton Rubber Co., American Rubber Co. and Boston Rubber Co. The location for the new selling department has not yet been decided upon, but will be at some point in the district where large buyers congregate, who visit the clothing trade.

* * *

The Stoughton Rubber Co. has for years been the Boston agent for the New York Belting and Packing Co., and this agency occupies one half of the large floor at 232 Summer street. Now that the previously mentioned merger is practically effected, the New York corporation will take over the management of its Boston business, and this will be transferred to some new location as soon as the right one is found.

* * *

One of the special advantages of the United States Rubber Co.'s consolidation of the boot and shoe units of distribution in Boston under one roof was proved during the middle week of last month, when the storm caused such an influx of rubber shoe orders that only a thorough system enabled Manager Porter to get out the goods with the despatch demanded by the emergency. For instance, on Friday, the 17th, nearly one thousand different shipments were packed and sent out, and these lots were considerably larger than the average orders. This company has an immense store and storehouse of ten large floors, and the shipping department is proving its efficiency in busy times.

* * *

The storm emphasized what was most evident for weeks before it happened, namely, the vexatious delays caused by freight congestion. Both shipments and deliveries have been so delayed as to cause actual loss of business, supplies failing to arrive when expected, and the car shortage interfering with the forwarding of orders. The Monaquot Rubber Co., at South Braintree, solved the shipping problem most satisfactorily, by trucking their goods over the road to Boston, and shipping by boat to their customers who could be reached advantageously that way. Mr. Turner is in receipt of several most commendatory letters because of this accommodation to the customers of the company.

* * *

The last week in December was a busy one with the branch store footwear salesmen of the United States Rubber Co. They gathered from Omaha, St. Louis, Indianapolis, Des Moines, St. Paul, Milwaukee, Chicago, Detroit, Toledo, Columbus, Pittsburgh, Rochester, Buffalo, Syracuse, Baltimore and New York, meeting in Boston on Tuesday, the 28th.

On that day the salesmen selling "American" rubber shoes visited the mill at Cambridge, and the Banigan men proceeded to Woonsocket. The next day they visited the National mill at Bristol.

The Candee, Hubmark and Wales-Goodyear salesmen inspected the Bristol factory, Tuesday, and their respective factories in New Haven, Malden and Naugatuck on Wednesday.

Thursday the clothing salesmen had a session at the American mill in Cambridge, and after a lunch at the American House, the afternoon was spent there at a business meeting.

Thursday night a reception was given to Colonel Colt, followed by a dinner in the great banquet hall of the City Club, at which nearly 500 were present. Felicitous addresses were made

by President Colt and by J. Newton Gunn, George H. Mayo, William E. Barker, E. S. Williams, Harry B. Hubbard, Charles C. Chase, Raymond B. Price, George W. Perry and Homer E. Sawyer.

Every participant in this conference was presented with a handsome gold badge, a *fac simile* of the trade-mark of the company.

The whole affair was a most successful one. All present were filled with enthusiasm as they left for their homes, determined to beat their last year's record.

Another event in the rubber footwear trade was the dedication of the new building recently added to the Apsley Rubber Co.'s plant at Hudson, which occurred too late to be fully chronicled here. The event was celebrated by a banquet, and a ball, in which all the employees of the company were invited to participate.

Owing to the demand for rubber heels and soles, I am informed that orders were so heavy and so pressing that the B. & R. Rubber Co., of North Brookfield, asked many of its employees to work Thanksgiving Day, paying extra wages to those who availed themselves of the opportunity. The busy season continuing, the workers themselves asked permission to put in Christmas Day at the factory, an offer gladly accepted, Mr. Richards promising to pay them double wages for this extra time, they to work ten hours and receive pay for two 12-hour days.

The creditors' committee of the Walpole Tire & Rubber Co. announced the sale of the land, buildings and equipment of the company at Walpole and Foxboro, Massachusetts, to the Standard Woven Fabric Co., Framingham, Massachusetts, for \$188,000, which was to be paid on or before December 15, 1915. The Standard Woven Fabric Co. issued \$500,000 worth of 6 per cent preferred stock, to pay for the plant and take care of re-equipment for its purposes, and the entire issue was promptly underwritten. The Walpole plant includes 70 acres of land and 16 buildings, having 175,000 feet of floor space. It will be utilized by the purchasers in the manufacture of Multibestos brake lining and other specialties. Eventually the company expects to erect additional buildings, consolidate its business at Walpole and dispose of the Framingham property.

As a result of an all around increase in its business, the Empire Rubber & Tire Co. has removed its headquarters to more commodious accommodations in the large, new fireproof building at 179 Massachusetts avenue.

In the suit brought by the Boston Rubber Shoe Co., which applied for an injunction to prevent the State treasurer, the tax commissioner and attorney-general from taking steps to enforce payment of an additional tax of \$40,161.99, levied as a franchise tax, as reported in THE INDIA RUBBER WORLD of December 1, Judge Pierce, in the Supreme Court, dismissed the bill applying for the injunction, on the grounds that the company could raise the question as to the constitutionality of the statute under which the tax is assessed in defending the proceedings which have been commenced by the State officials above mentioned, to enforce payment of the tax.

This year's annual meeting and dinner of the New England Wholesalers' Association was held at Young's Hotel, on December 8, 1915. The usual annual reports were presented and officers elected for the ensuing year. One of the post-prandial orations was an interesting address by William E. Barker, manager of sales of the United States Rubber Co., who recently returned from a business trip to Europe and spoke on the subject of "Rubber Trade Conditions at Home and Abroad."

Bankruptcy proceedings were instituted against the Columbia Rubber Co. on December 22, by its creditors. The claims of the petitioners amount to \$2,140.79.

E. S. Kidder, manager of the United States Tire Co., in this city, attended the conference of the branch managers in Detroit.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

THERE is a seeming incongruity in the statement that an unusual degree of prosperity caused the shutting down this week of the Ajax Rubber Co.'s plant and two departments of the John A. Roebling's Sons' Co., yet such was the case. The odd situation was brought about by the congestion of the freight yards and tracks in and around Trenton, preventing the movement of carloads of coal destined for the establishments referred to. Operations have been resumed, however, at both the Ajax and the Roebling plants and they are unusually busy. Not in many years have the railroads been so severely taxed to take care of both incoming and outgoing shipments of raw materials and manufactured goods. The rubber manufacturing companies are seriously inconvenienced by existing freight conditions. Recent orders of the Pennsylvania Railroad Co. prohibit the agents from accepting consignments destined for New York with the exception of foodstuffs. In many sections not a train of cars can be moved, and it is estimated that 20,000 loaded cars are blocked on the tracks between Jersey City and Pittsburgh. Trenton rubber manufacturers generally agree that 1916 holds promise of unusual prosperity for the trade, as many substantial orders for next year have already been booked.

The Ajax Rubber Co. has been incorporated, under the laws of New York, with a capital of \$5,000,000—all common stock of \$50 per share par value—to take over the business of the Ajax-Grieb Rubber Co. Of the total stock, \$3,000,000 will be issued at once to exchange for outstanding Ajax-Grieb shares, and of the remainder, part will be sold and the proceeds employed in enlarging the Trenton plant. It is stated that this company's contracts, with 300 dealers, aggregate \$3,000,000, and for the period ending August 30, 1916, gross sales of \$4,500,000 to \$5,000,000 and net earnings of \$750,000 are predicted. The company's annual earnings for four years ending August last, approximated \$450,000, equivalent to \$7.50 per share on the stock.

The Essex Rubber Co. announces that the department in which condensate was manufactured has been sold to the Pouvaill-Smith Corporation, Poughkeepsie, New York, organized with \$2,500,000 capital by J. Wilson Poucher, Elias C. Vail and Grant E. Smith, all of Poughkeepsie, to manufacture electrically heated steering wheels for automobiles and other automobile parts. The transaction was prompted by the fact that this department had outgrown the accommodations the Essex Rubber Co. were able to afford it. The Pouvaill-Smith Corporation will have the best of manufacturing facilities, and H. S. Morgan, manager of the department for the Essex company, goes with the new company as factory manager, besides being interested in the corporation financially.

The Roebling plant, which was recently visited by a very disastrous fire, was again threatened this week when a blaze was discovered in one of the cleaning departments. The prompt discovery of the blaze was all that prevented a serious conflagration, as the flames were making rapid headway when the alarm was turned in.

General C. Edward Murray, head of the Empire Tire Co., was one of the leading contributors to the poor children's Christmas Fund raised in Trenton.

Alfred Whitehead, secretary of the Whitehead Brothers Rubber Co., has taken possession of his new \$15,000 home on Perdieris avenue in this city.

C. C. Ferry has been appointed sales manager of the Delion Tire & Rubber Co., and will make his headquarters at the Trenton factory.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

The big Auto and Industrial Show held at the Akron Winter Garden, December 11 to 18, 1915, evidenced in highly attractive form the growth and prosperity of this exceedingly live town. This exposition, which was the second annual affair of its kind, outvalued the one of the year before—a natural sequence to the immense growth, during the intervening period, of the industries represented. The attendance also was doubled, and the scheme of lighting, the decorations, the exhibits and their arrangement, all received most favorable comment.

Akron rubber men concur in the widely prevalent report of an early rise in tire prices. As all the materials have gone up in price, if quality is to be maintained the completed product will naturally share in the upward tendency.

This picture shows the present plant of the Firestone Tire & Rubber Co., covering 31 acres of floor space.

The original Firestone factory was built in 1902. The entire office force then consisted of H. S. Firestone and six others. Now, over 700 persons are required to handle the office work of the company, while the total of officers, department heads, branch managers, superintendents and other helpers connected with the organization reaches 6,000.

In the last four years, since the new factory, consisting mainly of four large wings, was built, the race between production and demand has necessitated constant additions to the plant. Last year alone showed an increase in output of 78 per cent. Among

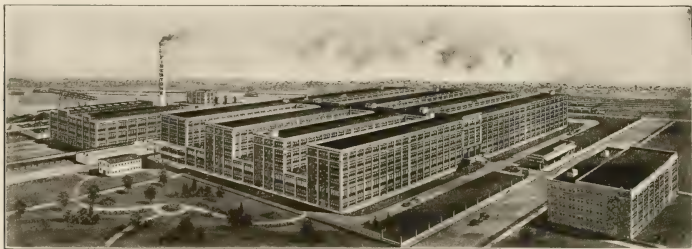
On December 16, 1915, in the Court of Common Pleas, Cuyahoga County, Ohio, the Firestone company was granted a perpetual injunction against a raincoat company using the name "Firestone." The raincoat company was operating stores under the name "Firestone Raincoat Co."

The American Hard Rubber Co. has sold the factory building and site where it has been located for so many years to The B. F. Goodrich Co. This transaction was recently consummated and will necessitate a change in the original plans for the new buildings now being erected at East Akron for the American Hard Rubber Co. Two buildings, 400 x 50 feet, will be built, according to the most approved ideas of modern factory construction, and possibly further additions will be made to accommodate the removal of the entire plant from its historic home.

It is estimated that the business of The B. F. Goodrich Co. has expanded in a remarkable degree—150 per cent increase since 1912. The regular quarterly dividend of 134 per cent has been declared, payable January 1 to holders of record December 1, 1915. Further action on dividends is anticipated early in the year.

The Goodrich company had the honor of supplying trucks equipped with Goodrich safety tread tires to convey the famous Liberty Bell to and from the special cars in which it traveled to the San Francisco Exposition and down to the San Diego Exposition. The ancient and honored emblem is now at rest again in Independence Hall, Philadelphia, after a triumphant and much lauded journey.

The Akron Pigment Co. is making a filler of recognized excellence, which is extensively used in rubber mills all over the world. The company has a substantial gray stone plant on Miller avenue. George Probert, general manager, has an extensive acquaintance throughout the trade in the United States and Canada, and excellent connections in Europe.



PLANT OF FIRESTONE TIRE & RUBBER CO., COVERING 31 ACRES OF FLOOR SPACE.

the most recent extensions are those on three of the big main wings, and the doubling of a six-story separate factory building.

The three-story club-house which is being built for employees will contain every modern facility for the comfort and pleasure of its users, including a large swimming pool, bowling alleys, barber shop, shower bath and lockers in the basement, and club rooms and a large auditorium on the top floor, which can be used as a theater, assembly hall, dance pavilion, etc. The two intermediate floors are equipped as restaurants for the factory and office force.

The completion of the additions now in progress will allow for an increase in tire output from 7,500 to 12,000 per day.

The distinctive trade-mark of the latest Firestone tire is a black tread combined with a red side wall.

The Lincoln Rubber Co. has purchased the plant and furnishings of the Summit Rubber Co. at Barberton.

The Star Rubber Co. recently obtained a permit to add a \$30,000 building to its present plant. This extension means employment for 50 more men.

The Mohawk Rubber Co. celebrated the opening of its new factory building by a Christmas dance, held on the third floor of the factory, December 28, 1915.

At a luncheon given by the Akron Automobile Club at the Hotel Portage, December 14, 1915, attended by many well-known automobile men, C. R. Raymond, of The B. F. Goodrich Co., acted as toastmaster.

Herman Haase, rubber testing expert of the Goodrich company, gave an interesting lecture on "Crude Rubber" before members of the Akron Real Estate Board at their luncheon on December 7.

On the theory that some inducement should be given for exercise of brain as well as body, J. P. Loomis, director in the Goodyear Tire & Rubber Co., and trustee of the University of Akron, has donated a solid silver trophy cup, to be awarded to the high school whose students make the best showing in grades during their freshman year at the University of Akron. The cup will become the permanent property of the school which wins it five times.

At the annual meeting of the Goodyear Tire & Rubber Co. held at Akron, December 4, 1915, there were several promotions among the staff. S. M. Stadelman and P. W. Litchfield were elected vice-presidents, continuing in their former positions as sales and factory managers; H. J. Blackburn was made second assistant treasurer, and A. F. Osterloh, formerly assistant secretary, was elected secretary. He is also assistant sales manager.

Following is the balance sheet of the Goodyear company, as compared with that of the previous year:

ASSETS.		1915.	1914.
Real estate and buildings		\$3,883,296	\$3,696,537
Machinery and fixtures		3,062,269	3,085,107
Patents, trade marks, etc.		1	1
Securities owned		80,663.6	777,640.6
Preferred stock unissued		58,439	543,593
Notes receivable of officers, employees, capital stock		1,045,816	505,283
Inventory		7,763,189	4,567,460
Accounts and notes receivable		4,759,246	3,328,693
Advances to agents, etc.		58,020	280,655
Prepaid stock unissued		1,766,352	2,862,706
Advances to Goodyear, Inc. Co. and Goodyear Heights Realty Co.		1,047,661	885,315
Surplus assets		1,717,230	1,183,418
Prepaid rentals, etc.		371,529	352,893
Total		\$26,279,927	\$21,459,335
LIABILITIES.			
Preferred stock		\$6,650,000	\$7,000,000
Common stock		8,377,300	7,991,110
Purchase accounts payable		1,565,705	410,575
Sundry accounts payable		378,894	257,509
Res. for doubtful accounts		558,936	564,327
Depreciation of plant		1,717,230	1,183,418
Surplus		7,031,940	4,052,395
Total		\$26,279,927	\$21,459,335

Plans are in progress for three more additions to the Goodyear plant: a five-story factory, 60 x 150 feet; a garage for employees' automobiles, 105 x 60 feet, and a three-story time office, 60 x 20 feet. The basement of the time office will be used for shower baths, toilets and wash rooms, the upper floor for a restaurant and rest room. The estimated cost for these additions is \$110,000.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE year that has just closed will be recorded as one of the most notable in the history of the rubber industry of Rhode Island. There has been no time during the entire twelve months of 1915 when the rubber factories of the State have not been rushed to their fullest capacity, or when there has been a sufficient number of skilled employees to fill all demands for help. While the regular volume of business indicated conditions that would have afforded the various factories ample employment for a normal force and schedule, the extraordinary volume of war orders from Europe increased the demands upon the plants to an extent never before equalled.

Those factories manufacturing rubber boots, secured numerous large-sized orders from Europe early in the year, so that many of the regiments composing the forces of the Allies were supplied with Rhode Island boots for trench work, orders for which have been duplicated in a majority of instances. For several months, during the earlier part of the year, the factories were handicapped to a greater or less extent by the embargo

that was placed on plantation rubber, but this was modified later, so that the local factories had little difficulty in securing all the rubber they needed.

During the year several of the mills have been enlarged, and in all plants there have been extensive alterations and improvements. At the present time the different concerns are working on a full-time card, or better, in nearly every department, and the outlook is said to be good. Evidences of this are seen in the fact that none of the plants were closed for the Christmas holidays, as has been the custom for many years. In some instances the number of orders on hand is sufficient to maintain a full working schedule for several months to come.

One feature of this unusual activity among the rubber factories located at Bristol is the increasing dearth of suitable tenement houses and boarding places for the employees. There are no houses for rental, and an unusually large number are contemplating building homes for themselves. The necessity for more houses is seen each morning in Bristol when large numbers arrive from Warren, Riverside, Barrington and other neighboring places.

Recognizing the lack of accommodations, the officials of the National India Rubber Co. several months ago leased the De Wolf Inn—a large hotel that for several years was used as a summer resort—and had it fitted and equipped as a boarding place for their women employees who were not otherwise provided for. Thus suitable accommodations were afforded for nearly 75 operatives and the experiment has proven a success, both for the corporation and the operatives, and has gone a long way toward solving this difficult problem.

The plant of the National India Rubber Co. at Bristol was the scene, on December 28 and 29, of a meeting of the salesmen of the United States Rubber Co., when upwards of 400 representatives from the different branches in the United States gathered to attend the meetings arranged at the big factory by Vice-President LeBaron C. Colt and other officials.

Rooms at the plant had been fitted up for the display of the many styles and qualities of goods, including sporting and outing shoes and insulated wire, manufactured by the company. Here the sessions were held and, following inspections of the various lines, the managers and other representatives of the various sales departments connected with the United States Rubber Co. addressed the men, with the view of making them better acquainted with the processes of manufacture, from the beginning to the shipping of the finished products.

One of the most important and interesting features of the meeting was a tour of the big plant, conducted by the officials, which gave the visitors a closer acquaintance with the goods they sell. All of the methods, machines and processes of making, from the raw material to the finished product, were explained.

A few days before Christmas, the employees of the National India Rubber Co. contributed \$788.08 as a donation to the poor and unfortunate in Bristol. This money was distributed through the various charitable organizations and clergymen of the town, irrespective of denomination.

The following is the detailed list of the different departments, together with the amount contributed, from each department: Officers, \$50; office, \$18.75; gaiter and quarter room, \$230; calender room, \$230.5; shipping department, \$13.60; cutting room, \$17; yard, \$19.50; heater room, \$10.35; shoe department, \$114; night gang, \$10.75; watchmen, \$3.50; stitching room, \$127.85; packing room, \$24.50; check room, \$10; machine cutting department, \$9.25; printing department, \$15.13; carpenter shop, \$12.10; machine shop, \$5; engineers and firemen, \$5.50; wire department, \$68.25; total, \$788.08.

A final meeting in bankruptcy was held a few days ago in the case of Edward R. Young, retailer in rubber goods in this city, and the trustee, Norman S. Case, was discharged, the creditors having received 2½ per cent.

ANNOUNCEMENTS FROM THE RUBBER CLUB.

DE LAYS in shipments to neutral European countries, complained of by American exporters, are often due to neglect of the shipper to carefully observe directions, especially in the preparation of the invoices that must accompany the application for permission to ship. Trade terms and abbreviations—sometimes, in the case of druggists' sundries, for instance, comprehended only by the trade, must not be used; weights and values must be given according to British as well as American standards. The English hundredweight, for example, is 112 pounds, and both English and American hundredweights, as well as pounds sterling and dollars and cents, should be shown on the invoices. Six copies of these invoices are required by the British War Trade Department and should be made out at once to meet the British departmental requirements. If these conditions are not carefully observed, a delay of a month, at least, is inevitable in obtaining the license applied for.

In the case of rubber goods destined for Sweden, annoying delays were often reported. These, it was ascertained, were due to the anxiety displayed by Great Britain that such goods should not be re-exported to enemy countries. A certificate from their governments to this effect was in many instances required. This source of trouble has in large part been obviated, but manufacturers should scan, with the greatest care, all orders received from neutral European countries, in order to avoid violation of the bonds and agreements into which they have entered.

Attention of rubber manufacturers is called to the fact that the British government has ruled that Madeira and the Cape Verde Islands, Portuguese possessions off the African coast, must be regarded as neutral European territory when making shipments of rubber goods. Accordingly, all consignments for these islands must be shipped in the usual manner, by way of the United Kingdom.

To Gibraltar and Malta, shipments may be made without restrictions, in the same way as to any non-European possessions.

Licenses to ship rubber goods to neutral countries being good for six weeks from the date of issue, it is advisable to make application in advance, as, should the time expire, an extension will be granted. Licenses are obtainable only from the War Trade Department, 4 Central Building, Westminster, London, S. W., England, and applications should be filed there, with invoices and all the evidence required to prove the ultimate destination of the goods. They will be dealt with strictly on their merit and in consecutive order.

When the license is granted, the London agent, or forwarding agent, should at once cable the fact to the manufacturer, so that there may be no loss of time in obtaining cargo room and making the shipment before the license expires.

Arrangements are being made whereby the granting of licenses for tire equipments for automobiles shipped to Europe will be greatly facilitated.

"RUBBER CLUB DAY" IN NEW YORK.

The Rubber Club of America, Inc., and the various divisions, are to hold their annual meeting and dinner at the Waldorf-Astoria, New York, on January 28, and President Hodgman would like to distinguish the day in question as "Rubber Club Day" in the annals of the city and the trade.

The meeting of the Mechanical Rubber Goods Division and Rubber Sundries Division, will be held at the hotel in question at 2 p. m. At 4 p. m. at the same place, will be held the meeting of the Rubber Club of America, Inc., and at 5 p. m. the meeting of the directors of that organization will be held. At 7 p. m. the dinner of the Rubber Club will take place in the Astor Gallery and Myrtle Room of the hotel. Every effort is being made to insure an unprecedented success for both meetings and dinner,

and if a large attendance, an attractive program and interesting speakers may be regarded as factors, it is already certain. The key note of the occasion will be American patriotism and American rubber industry. Members of the Rubber Club are earnestly requested to remember "Rubber Club Day," January 28.

RUBBER CLUB DIRECTORS FOR 1916.

The Nominating Committee of The Rubber Club of America, Inc., met at the Union League Club, New York, December 9, 1915, at 3:30 p. m. Those in attendance were: Homer E. Sawyer, chairman; Charles T. Wilson, Henry C. Pearson, Russell Parker; Bertram G. Work, being absent, was represented by Howard E. Raymond. The following nominations were unanimously made:

DIRECTORS FOR 1916.

Van H. Cartmell, New York City.
William E. Brugg, New York City.
J. S. Lowman, New York City.
W. O. Rutherford, Akron, Ohio.
George E. Hall, Boston, Massachusetts.
P. W. Litchfield, Akron, Ohio.
Henry Spadone, New York City.
Charles T. Wilson, New York City.
H. Stuart Hotchkiss, New Haven, Connecticut.
William J. Kelly, New York City.
Frederick H. Jones, Andover, Massachusetts.
Harvey S. Firestone, Akron, Ohio.

These nominations will be voted on by members of the Rubber Club at the annual meeting, January 28.

DELEGATES TO INTERNATIONAL TRADE CONFERENCE.

The following delegates were appointed by The Rubber Club of America, Inc., to attend the International Trade Conference, held under the auspices of the National Association of Manufacturers of the United States of America, at the Hotel Astor, December 6, 7 and 8, 1915: William G. Grieb, Ajax Rubber Co., Trenton, New Jersey; J. A. Lambert, Acme Rubber Manufacturing Co., Trenton, New Jersey; Henry D. Reed, Bishop Gutta Percha Co., New York; Russell Parker, Parker, Stearns & Co., Brooklyn, New York.

A HARMLESS POLICE CLUB.

The invention of a rubber-covered police club is reported from Christiania, Norway, on which a United States patent has been granted. Unlike a somewhat similar device, a description of which appeared in THE INDIA RUBBER WORLD of January 10, 1897, and which consisted of a practically rigid core of hickory encased in rubber, the present device, which is the invention of a Christiania policeman, has a flexible metallic core of cabled wire, terminating in ferrules, covered with rubber or gutta percha. Such a baton, in the hands of a stalwart policeman, is capable of delivering a stunning blow, without causing wounds or broken bones. Thus, while more effective, it is more humane than the weapon with which the policemen in large cities are usually equipped. The police force of Christiania now carries the Welens club, the patent on which is controlled by Anton Berg, 72 Munkedamsveia, Christiania, who is connected with the rubber and balata interest in that city and who is desirous of exploiting the patent or selling rights for the United States, Canada and Great Britain.

THE AUTO SHOW FOR 1916.

The Grand Central Palace, New York, is to be transformed, for the Annual Automobile Show, to be held there during the week commencing December 31, into the "Palace of Motoria," the goddess who watches over the destinies of the automobile and its votaries, and will present a gorgeous spectacle. The technical features will be in keeping with the decorations and everything new and meritorious in automobiles and accessories will be on exhibition, displayed in the artistically accessible style to which the building so admirably lends itself. The show opens on the evening of December 31 and will remain open for a week.

The India Rubber Trade in Great Britain.

Our Regular Correspondent.

FOR some time most of our large cable works have been on the list of controlled works under the Ministry of Munitions. Now, in addition, some of the large rubber works—notably, the Dunlop Rubber Co. and the North British Rubber Co.—have been added to the list. This means that government work and demands have priority over private business and, further, that strikes are not allowed, and that work-people who lose time or transfer their services elsewhere are to be dealt with by the local munitions tribunal and not by the management of the rubber firm. Again, with regard to recruiting such men as are considered indispensable to the business of the controlled works: they are "starred," as unavailable for enlistment. Outside the above, the rubber firm maintains its individuality and carries on its business as usual, with the exception of having more or less prolonged visits from government officials on much the same lines as have long been laid down in the government specifications for rubber goods.

Certain firms making necessary chemicals for the trade have also been recently put on the controlled list. The effect of this has been to increase the difficulties previously experienced by rubber works not engaged on government work in getting their supplies; or, if they get them, it is at an increased cost. It does not appear that the fact of being controlled is looked upon in the light of a hardship. It is rather the other way, as the firms have less to apprehend from the natural and necessary visits of the recruiting officers as regards depletion of staff.

With regard to the general volume of business being done, one hears but little in the nature of complaint. The transit difficulty, however, is still acute, abnormal time being required for the delivery of raw materials and finished goods which have not the right of being labeled "on government service"; and there is no present prospect of a better state of affairs.

The main feature with regard to raw rubber has been the rapid rise towards the end of November to 3s. 7½d. per pound. This rise is due to the shortage of rubber for immediate delivery, combined with an uneasy feeling among manufacturers as to impending greater difficulties at the docks and on the seas, and it is generally expected that a 3s. level will be maintained for some time. There has been considerable activity lately in obtaining permits in London for direct shipments of rubber from the Far East to America, both by the New York and San Francisco routes. With the collapse of the German export trade and the restrictions which hamper the French output, it is not surprising that British manufacturers have received inquiries and orders on a greatly increased scale from practically all over the world. To such an extent is this the case with some of the more prominent firms that new business is not keenly welcomed. In fact, some important orders have only been accepted on the terms that cash must be paid before delivery and that no complaints can be considered if the goods do not come up to expectations. The principle of attending to the wants of old and regular home customers first is being strictly adhered to, as it is well recognized that the panic buying from new customers abroad is only because the latter cannot get the goods elsewhere and that in the future they will revert to their old channels of supply. With regard to sporting requisites, although the home demand has certainly fallen off, I am informed that the business done for abroad shows little diminution, so that the rubber manufacturers are not suffering, whatever may be the case with the home shops and stores which specialize in the retail sale of such goods. And although it may be a fact, stated in THE INDIA RUBBER WORLD for Sep-

tember, that England has lost half her export rubber trade, the very satisfactory state of business reported all around shows that the loss is not felt.

RECLAIMED RUBBER

All permits to ship reclaimed rubber to Sweden were withdrawn in October, but from negotiations which are now proceeding, it is considered probable that this restriction will be shortly withdrawn.

An interesting and informative article—as far as the general public is concerned—on reclaimed rubber appeared in "The Engineer," of London, on November 5. Attention is drawn to the fact that by the introduction into England of the alkali process as worked on a large scale in America, the British reclaiming industry has now developed very largely and is a much more important and progressive business than was the case 20 years ago.

GOLOSHES.

The winter has set in exceptionally early this year in Great Britain, and to judge by reports, severe weather has been very general on the Continent at an unusually early date. We have had heavy snowfalls, and skating on the deep Cumberland lakes in November, so that the prospect of a good season for such goods as goloshes and overshoes is assured. With regard to the source of overshoes, competition is keen between the home-made article and the imported American, which has strong adherents, not altogether due, I must confess, to its having been longer in the field. Overshoes are now generally stocked by shoe stores, as well as by the shops which deal in rubber goods only, and in nearly all cases both the British and American makes are on sale. Similar sizes and makes for men cost 5s. for American, or "Bostons," as they are usually termed, and only 3s. 11d. for British. In women's goloshes, the prices are 3s. 6d. and 2s. 11d. A popular make for women is that furnished by the Bay State Rubber Co. at 3s. 6d. It is somewhat lighter than the British and, like other Boston makes, can be obtained in half sizes. This matter of half sizes, which seems to have been ignored by British makers, is undoubtedly in favor of the sale of "Bostons," both for men and women.

HOT-WATER BOTTLES.

So as to neutralize any possible further straining of the present relations between Great Britain and America, which might be apprehended from the remarks on goloshes, I now refer to an article in which the trend of public opinion is in the reverse direction. This is the hot-water bottle which, after being under a cloud for a few years, seems to have quite regained its former popularity. This is in a large measure due to the prevalence of hospitals, both military and Red Cross, up and down the country. Although some of our largest rubber manufacturers still announce that while their bottles are of the highest quality, they give no guarantee against bursting, others have modified their attitude in this respect and plenty of bottles are on sale bearing guarantees. The retail prices range from 4s. 6d. to 6s. 6d., according to sizes of 8 x 6 inches to 12 x 10 inches. Lower-priced bottles are not guaranteed. The rubber stores complain that discredit has been brought upon the goods owing to druggists putting them in the windows until decay is setting in and then getting rid of them quickly by lowering the price. This sounds quite probable, but there has also been carelessness on the part of purchasers, both in using boiling water and leaving them lying about anywhere. Instructions are now issued by the retailers with regard to proper use and storage. The complaint about the American hot-water bottles is with

regard to the seams, the overlap being one-quarter inch as compared with the customary one-half inch of the British makes. A point to which considerable importance is attached in the hospitals is the fitting of the stopper with a small washer, this having frequently been overlooked in the past. To refer to a matter of history, I may say that the interruption of the British business was due to a legal action a few years ago, when the chemist who sold a defective hot-water bottle was mulcted in damages resulting from its bursting when in use.

TRENCH CAPES AND STOCKINGS.

Trench capes are in considerable demand from the men at the front. The garment may be described as a general utility article that a man in the trenches would be likely to find handy. Besides being a good waterproof cape, it can be made to serve as a waterproof sleeping bag, a ground sheet, and a supplementary kit bag or "hold-all." Large numbers have been ordered by the government and issued to the men, but many requests are being made by the men to their friends at home to send them a "trench cape" and there is consequently a large demand for them. Leg boots are being sent out in large numbers on the same plan, and Charles Macintosh & Co., Limited, are making a waterproof stocking for the protection of the soldier in the wet trenches, to sell at 14s. 6d. per pair.

RUBBER ERASERS AND STAMPS.

German compulsory withdrawal from the rubber eraser business has furnished an opportunity to British firms, who have not been slow in stepping into the breach. One concern, the Mountford Rubber Co., Birmingham, has introduced a triple-layer eraser in red, white and blue rubber, the patriotic colors greatly encouraging to the sales.

Rubber stamp manufacturers also have not been backward in taking advantage of the war situation. "War emergency stamps" in infinite variety have been turned out, which some day may have special value to the collector of "curios." Here are some of the legends borne by standard stamps, impressions of which are becoming common on business documents: "This quotation is not binding"; "Business as usual"; "Do please help us and remit by return"; "The crisis has hit us hard"; "Owing to the present circumstances, we cannot commit ourselves in any way"; etc., etc.

NEW WORKS.

The company which has for some time been exploiting the John Bull tire, which has been manufactured at various rubber works, has now started manufacturing on its own account. The works are known as the Leicester Rubber Co., of the Granby Rubber Works, Post Office Place, Leicester. H. H. Burton is the managing director and Mr. McGhee the manager. The machinery, which is new throughout, is electrically driven. A sort of tram tire used for hand trucks is one of the specialties of the company.

PERSONAL MENTION.

J. Martindale Davies, late works manager of the New Liverpool Rubber Co., Limited, has now taken up a position at the works of J. Lyne Hancock, Limited, Goswell Road, London.

Lieutenant-Colonel Fallows, of the Leyland & Birmingham Rubber Co., who was killed at the Dardanelles, has been accorded the posthumous honor of being mentioned in dispatches by General Sir Ian Hamilton.

Sir Frederick Smith, Baronet, chairman of Charles Macintosh & Co., Limited, has been appointed to represent rubber and banking on the Manchester Recruiting Appeals Tribunal. This body has the duty of deciding *inter alia* as to which men are to be considered as indispensable for the carrying on of home industries during the war.

The new 2½-ton commercial car built by the Wells Motors, Limited, Glasgow, has many interesting features. One in particular is that rubber-impregnated canvas is used for the universal joint.

UNITED STATES ENGLAND'S BEST RUBBER CUSTOMER.

At a recent annual meeting of an English rubber plantation company, the chairman gave some interesting details concerning the export of rubber from the United Kingdom, together with its approximate value. On this point he spoke as follows:

It is perhaps not generally recognized what an important factor rubber is in our exports to America and in assisting to adjust the exchange with that country at the present time. The amount of rubber exported from the United Kingdom to the United States last year amounted to nearly eight millions sterling, and if that going direct from the Middle East is added, the total reaches between ten and eleven millions. In the first case it represents about one-sixth and in the latter one-fifth of the total exports from this country to the United States. Rubber is two and a half times the value of any other item in the list of our exports to America, and occupies the fourth place in value among the imports of the United States from the whole world. Probably about 70 millions of British capital is invested in the rubber industry in the Middle East, and although at the present time not more than about half of this large capital outlay is productive, it will return for the present year produce of the value of from 18 to 20 millions sterling. The development of the plantation rubber industry and the investment of this capital in the Middle East has also enabled this country and our Allies to have at their disposal and under their control by far the largest part of the world's supply of one of the things essential for carrying on the present struggle. The past year has served to place the industry in a still stronger position.

RUBBER GROWERS' ASSOCIATION, INC., EXTENDS ITS SPHERE OF OPERATIONS.

At an extraordinary general meeting of the Rubber Growers' Association, Inc., held in London recently, provisions were made for certain alterations in the memorandum and articles of association that will result in an important addition to the scope of the association's activity. The Malaya and Ceylon research funds—the former in existence for six, the latter for five years—have hitherto been administered by firms who guaranteed the funds. While the entire body of members profited by the research work, the onus of maintaining and directing it rested upon a comparatively small number, an association as it were, within the parent body. It was proposed to remedy this condition by amalgamating the research fund with the association, readjusting the subscriptions so that they will cover the funds. The resolutions were adopted unanimously, without discussion.

By these changes in the memorandum of association power is taken to engage in research and experimental work in connection with the cultivation and manufacture of rubber and rubber goods; to distribute among the public information as to the possible uses of rubber; to collect and circulate statistics and other information; to improve the technical knowledge of persons engaged in the industry by means of lectures, classes, examinations and scholarships; to form a museum and library, and to establish or contribute to any benevolent fund for the assistance of persons engaged in the industry.

Republic Rubber Co., Limited, has been registered with a capital of £25,000 [\$121,662] to manufacture and sell at wholesale solid and pneumatic tires of all kinds, mechanical goods, cables, etc. The capital is issued in shares of £1 [\$4.86] each. The office of the company, of which E. A. Gleich is a director, is at 5 Giltspur street, London, E. C.

Campbell, Achnach & Co., manufacturer of waterproof and india rubber goods, Glasgow, Scotland, has had plans prepared for additions made necessary by the growth of business.

The official receiver of the Margetts British Sectional Tire Co., against which a compulsory winding-up order was issued on July 13, reports total liabilities of £9,346 [\$45,482], assets nil. The company was organized to manufacture a sectional tire, for the patents, rights, etc., of which it agreed to pay £169,000 [\$822,438], and a royalty of 6 pence [12 cents] on each section or "cuff" of tire sold.

THE RUBBER SITUATION IN FRANCE.

By Our Regular Correspondent.

THE general position here remains much as it was at my last writing. Manufacturers producing tires and other rubber goods required by the army and navy continue to be very busy while other rubber mills are comparatively idle.

The evening of the day I mailed my last letter, a fire broke out in the boiler-house of the Torrilhon rubber works at Chamalières, near Clermont-Ferrand, Puy-de-Dôme, and a serious conflagration would no doubt have resulted had it not been for the promptness of the company's fire brigade.

The workmen had left the factory at 6 o'clock and only a few clerks were at work in the offices when at a quarter past seven fire was discovered in an old brick building used as the boiler room. The firemen on duty were prompt and intelligent enough to open the steam blowoff valve, thus preventing an explosion, which probably would have demolished the whole plant. The property loss resulting from the fire was large; however, it will not interfere with the operation of the plant or result in laying off any of the employees.

The Torrilhon company, or Société Anonyme des Anciens Etablissements J. B. Torrilhon, as it is registered, is one of the oldest rubber manufacturing companies in this country and has a capital of 6,000,000 francs [\$1,158,000].

MACHINERY IMPRESSMENT.

Official notices were posted recently on the walls of every town, village and hamlet throughout this country, calling for the compulsory declaration to the local authorities of all lathes, planers, drill-presses, hydraulic presses and steam hammers, with the exception of those to be found in State workshops. This declaration is incumbent on the owners, or in their absence, the landlords, guardians or other persons in charge of the buildings in which the machinery is to be found. Penalties varying from \$19 to \$400 are imposed for failure to declare or for false declaration. Obviously the object of this measure is to obtain the use of all machine tools which are standing idle or at present in use for other than military purposes. These idle tools are being requisitioned or in certain cases being put into use where they stand. The tire presses at the Continental factory near Paris have been taken over by the military authorities for the manufacture of 75 millimeter shells. It will be remembered that this factory is a branch of the Continental Caoutchouc & Gutta Percha Co., Hanover, Germany. The French factory of the British Dunlop Rubber Co., Limited, is being almost entirely used for shell making, and other tire factories possessing hydraulic presses not absolutely needed for the tire business have been turned over to the manufacture of shells.

GASOLINE SHORTAGE.

In my last letter I stated that the gasoline famine was not affecting the rubber industry here. This also applies to the use of motor vehicles generally, the supplies of gasoline are ample for military purposes and, owing to war conditions, there are very few motor vehicles in private use; so the shortage is not very severely felt except in Paris, where it has interfered with the taxicab service.

As a general rule, Paris taxi-drivers purchase their own fuel and retain a certain percentage of their receipts. In some instances the companies operating taxis are able to supply gasoline to chauffeurs at better prices than it could be obtained by them in the open market. Prior to the war the amount supplied was about 3½ gallons per day. This has been cut down to 2½ gallons, with which the chauffeurs are expected to travel 60 miles. The taxi-drivers claim that they cannot average more than 50 miles with this quantity of fuel and when they have used up their allowance of 2½ gallons they return their cabs to the garage, refusing to purchase gasoline in the open market. The result is

that taxis are very scarce after nightfall, when they are most needed by theatergoers and others. Motorbus services in Paris are now practically non-existent and this, coupled with the lack of taxis, is causing great loss to theaters and restaurants and bringing protests both from the public and from the owners of these establishments. Appeals have been made to the municipal authorities who, however, have no power to ameliorate the situation. The few refiners who monopolize the gasoline supply of France are being much criticised, as it is maintained that an abundant supply can be obtained from America and therefore there is no reason for the present shortage. The French Government has not imposed any additional taxes upon gasoline since the war started, yet prices have increased more than 35 per cent. The retail price is 270 francs [52 cents] per gallon outside Paris, where there are no local taxes, while the "octroi," or city tax, raises the price to 425 francs [82 cents] per gallon within the fortified walls of the capital.

SEQUESTRATION OF TEUTONIC FIRMS.

The Chamber of Commerce of Paris published last December the first list of German and Austro-Hungarian concerns whose property in France has been sequestered by the French authorities. The following thirteen firms engaged in the rubber and allied trades are taken from this list:

Société des Joint de Caoutchouc (rubber packing); Peter's Union (tires); Société Continentale (tires, etc.); Compagnie Continentale (tires and other rubber goods); Dusendschon et Cie (crude rubber); Bernhard Von Delden (rubber matting and linoleum); Delmenorster (linoleum); Glaser (rubber garments); Traun (rubber goods); Straus (rubber); Scherr (rubber heels); Lazlo (rubberized fabrics and linoleum); and Charles Nathan (electric wires and rubber).

SPORTING GOODS.

The practice of outdoor sports, which for a number of years has been receiving increased attention in France, is not languishing, as might be expected under war conditions. Football, tennis, hockey are still popular and tournaments are almost as frequent as in time of peace. The government encourages sports among the soldiers and every regiment of our army has several Rugby or Association football teams.

THE RUBBER SITUATION IN SWITZERLAND.

By Our Regular Correspondent.

THE position of Switzerland in the present struggle of nations is peculiar. The war has been the cause of great loss to this country; it is stated that the hotel industry alone has lost over 500,000,000 francs [\$100,000,000] since the outbreak of hostilities, while the fact that it is necessary to keep the army mobilized is a source of great expense. But these are not all our troubles. This neutral country is like a little island in the midst of the surging sea of fire and death by which it is surrounded on all sides. We have commercial treaties with all the fighting nations and do not wish to see any of these contracts broken, so our position is very difficult.

The Swiss national industries are all practically what might be termed converting industries: they are engaged in improving and increasing the value of raw materials and partly manufactured goods imported from abroad. Raw and partly manufactured materials are received from or through all the countries now engaged in a struggle for life or death, for manufacture and improvement, chiefly for re-exportation.

Practically from the beginning of the war there have been the Allies, on the one side, willing to furnish all the raw materials our industries could use and also all the manufactured goods Switzerland is accustomed to import, on condition that all these materials and goods be used at home and none exported to the central European powers. England, for instance, is willing to

furnish both crude rubber and rubber goods on condition that no rubber or rubber goods are sold to Germany and Austria-Hungary. The central European powers, for their part, offer to furnish what surplus goods and materials they can spare after their own needs are satisfied, and in exchange demand the supply of the merchandise of which they are deprived through the Allies' blockade.

The delicacy of the position in which Switzerland is placed can easily be imagined.

It is believed that the problem has been solved by the organization of an import trust known as the "Société Suisse de Surveillance Economique," or "S. S. S.," as it is briefly termed. This import trust has been chartered by the Swiss Federal Council to supervise the importation of merchandise and its distribution in the country and, under certain conditions, its re-exportation.

The "S. S. S." (Swiss Association for Economic Supervision) will attend to the importing of raw materials, partly manufactured materials and manufactured goods, for the account of third parties, and distribute these imports for use or manufacture in Switzerland, according to rules and conditions agreed upon at the time of the importation.

In deciding what quantities and kinds of merchandise should be imported, the "S. S. S." will be guided by information drawn from the statistics of Swiss imports for the years 1911, 1912 and 1913, which will be obtained from the Federal Council of our republic. In other words, the imports for 1911, 1912 and 1913 will serve as standards for determining the present needs of our country. To receive merchandise from the "S. S. S." the several trades and industries of Switzerland will have to organize responsible syndicates or associations which will have to guarantee that the merchandise furnished will be used as directed by the rules and regulations of the "S. S. S."

Raw materials imported by the "S. S. S." and goods manufactured from these raw materials will be allowed to be freely re-exported as follows:

1. To the countries from which the raw materials were obtained for importation into Switzerland, or to allies of these countries.

2. To neutral countries, as long as it is guaranteed that they will be consumed in these countries. If, however, the neutral country to which the merchandise is destined cannot be reached from Switzerland, without passing through the territory of a nation or nations at war with the country which furnished the raw materials to Switzerland, license to export will be withheld unless the latter country gives its consent to the transaction.

3. No merchandise can be re-exported to countries at war with the nation that furnished the raw materials for making it. Exceptions to this rule are merchandise in which the chief value is not the material imported. Thus, machinery and apparatus into which imported copper does not enter to the extent of more than 15 per cent of the total value, may be exported freely. Electrical machinery and apparatus can be freely exported on condition that the value of the copper it contains does not exceed 30 per cent of its total value.

Farming products that are purely Swiss and all other merchandise containing nothing but native materials can be exported freely, if not under embargo of the Swiss government.

Reports and statistics of the dealings of the "S. S. S." have to be furnished monthly to the governments agreeing to furnish merchandise through its intermediation.

The metal, textile, chemical and foodstuffs industries are already planning syndicates to avail themselves of the services of the "S. S. S."

The Swiss manufacturers were very anxious to see the "S. S. S." in general operation, for conditions were very trying, especially in the rubber trade and industry, where shortage in both crude rubber and rubber goods was creating much inconvenience. All kinds of tires were scarce and prices were rapidly

becoming prohibitive. The lack of motorcycle tires was most severely felt because motorcycles are very extensively used in Switzerland.

RUBBER FOOTWEAR.

It is winter now, the season during which quantities of rubber boots and shoes are needed in Switzerland. Russia, Germany and Austria-Hungary formerly furnished us large consignments of rubber footwear, but cannot supply them as long as this war lasts; and French and English manufacturers have all they can do to supply their own military and civil needs. We are told that America cannot deliver rubber goods to us on account of an agreement with Great Britain.

Some time ago an important rubber concern here attempted to place a big order for rubber goods in America and was informed by cable that all shipments of rubber and rubber goods from America are prohibited unless they be addressed to England, to her possessions or to her allies. This cable was given wide publicity here and was variously discussed by all our press organs. The following is a list of Swiss rubber and gutta percha manufacturers which may be of interest to your readers:

Tannerie Maennedorf, Staub & Cie, Maennedorf; solid rubber

truck tires.

Ausser & Cie, Feuerthalen; pneumatic tires.

P. Buchet, Geneva; pneumatic tires.

Chapuis, Geneva; pneumatic tires.

Charles Faure, Geneva; pneumatic tires.

Albert Muffert, Geneva; pneumatic tires.

Dubied & Cie, Convex; tire studs and rivets.

Aubert, Crenier & Cie, Isletta; electrical cables.

Suhner & Cie, Herisau; electrical cables.

Zürcher, Draht & Kabelwerke, Zurich; electrical cables.

H. Weidmann, Rapperswil; rubber insulators.

A NEW WATERPROOF CLOTHING FACTORY IN AMSTERDAM.

At Amsterdam, Holland, a factory is being erected for the firm of L. A. & F. L. Kattenburg, manufacturers of waterproof garments and wholesale clothiers of that city, Rotterdam, and Manchester, England. The foundation stone of the new factory was laid on December 1, 1915, by Alfred Kattenburg, Jr. The building will be 270 feet in length, with three stories and basement. It will furnish room for 800 to 900 operatives, and the site allows space for doubling the size of the building. In addition to up-to-date show rooms, offices, etc., the provisions made for the comfort and health of the employees are of the most modern character, including commodious dining rooms, well-equipped kitchens, dressing rooms, etc. The establishment is one of the most important in the Netherlands engaged in the manufacture of rubber garments and raincoats.

SWEDEN PROHIBITS RUBBER EXPORTS.

Sweden has prohibited the export of the following articles: Manufactures of soft rubber, excepting belting and boots and shoes; manufactures of hard rubber, ebonite, etc., or combinations with other materials; rubber toys and parts of toys; rubber in solution or in paste form (but not rolled into sheets or further manufactured), with or without compounding ingredients; also artificial soft rubber.

Following upon this action, the temporary suspension by the Rubber and Tin Exports Committee of the issue of licenses for shipment of rubber goods to Sweden has been, to a certain extent, removed. The India Rubber Manufacturers' Association has been informed that the Exports Committee cannot undertake to discuss the conditions under which applications for licenses will be dealt with, but they will consider any individual application on its merits.

LARGE TIRE ORDER PLACED IN JAPAN.

According to a clipping from a Yokohama, Japan, newspaper, orders aggregating 1,000,000 automobile and bicycle tires have recently been placed in Japan.

The Rubber Trade in Germany.

By Our Regular Correspondent.

THE only article in which original qualities are jealously maintained—the rubber tire—has been placed under strict embargo, as far as domestic trade is concerned. Every owner of rubber tires was ordered, as a preliminary step, to register them. The next step was their inspection by government officials and, if found suitable for military use, they were "commandeered," at a government appraisal, by the Power Wagon Department of the German Army. To prevent any tires slipping through its fingers, the government issued a decree prohibiting the sale of rubber tires of any description without the consent of the military authorities. Add to this the requisitioning of all motor vehicles that could be used by the army, and the position of the tire industry in Germany may easily be understood.

A "war meeting" of tire manufacturers was recently held in Berlin to discuss means for the relief of the tire scarcity and the advisability of establishing a central office, through which manufacturers could control all their purchases of crude rubber and thus prevent "corners" and speculation.

Tire and automobile manufacturers recently addressed a memorial to the war minister, calling his attention to the fact that while the casings made in German factories answered all requirements, the quality of the inner tubes was unsatisfactory, it being impossible, from the material at their command, to make good tubes. It was suggested that, at regular intervals, stipulated quantities of crude rubber of suitable quality be released to inner tube manufacturers, to enable them to maintain the average of quality.

Before the war broke out competition between German and foreign tire manufacturers in Germany was so bitter that prices were cut and overhead expenses increased to the extent that no reasonable margin for profit was left. The initial cause of the trouble appears to have been the opening by tire manufacturers of too many branches. As soon as a company opened a branch office with stock in a new place

smiths and retail dealers in cigars and cigarettes, not to mention the tremendous number of cycle dealers who handled automobile tires. The principal object of all these dealers was to make a showing. The sale of automobile tires



WOMEN TESTING INNER TUBES.

was merely incidental to their business and they were satisfied with extremely small profit, but the legitimate trade suffered. Prices were cut and under-cut, many people selling tires only for "beer money". In many instances tires worth \$40 were sold with from 50 cents to a dollar profit.

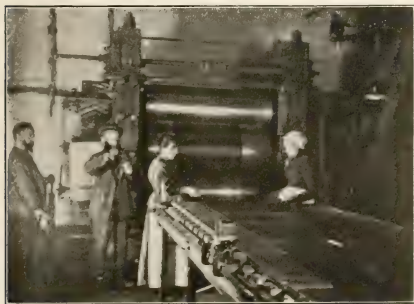
Tire manufacturers, at first, thought that the small dealer was of little importance to them, that people had to have tires and would buy them and that the dealer would have to sell even if he made no profit. They soon found out, however, that the price-cutting was as detrimental to their interests as it was to those of the dealer. The automobile tire trade was profitable to no one, not even to the consumer, who was at a loss to know what tire to buy and often bought the wrong one.

A movement is now under way in Germany to remedy this evil, and it is expected that dealers and manufacturers will cooperate in placing the automobile tire business on a solid commercial basis. German tire interests are also advocating the boycott of all foreign-made tires and an endeavor will be made to prevent dealers selling foreign-made tires, even if the tires are profitable to them. Attempts are being made to place all the former troubles of the trade at the door of foreign manufacturers, whether maintaining factories in Germany or not.

SOLID RUBBER TIRES.

The increasing demand of our army trucks for solid rubber tires led many of our manufacturers to take up this line, with which, in many cases, they were not at all familiar. Many costly mistakes were made in this way, the most common being the selection of compounds on the sole merit of their cheapness. Mileage guarantees were handed out indiscriminately, with the result that many have spent fortunes to learn that a rubber compound can never be too good for a solid rubber motor truck tire.

Our tire manufacturers are all very busy and expect exceptionally good business to follow the war. Horses will be scarce, and it is very likely that the use of motor vehicles will be further extended by the low prices at which used, but still serviceable machines will be sold by the army. Special companies have already been formed for rebuilding war automobiles. Automobiles require tires, and our manufacturers are going to see that foreign competition does not get the business. The lack of crude rubber will inconvenience our tire manufacturers for some time after the close of hostilities, but other branches of trade and



WOMEN RUBBER WORKERS—CALENDERING.

another company would do the same thing, with the result that one factory after another was obliged to support an ever-increasing number of branches and small stores, the turnover of which was very often too small to pay expenses.

In small places, where regular tire or automobile dealers did not exist, and even in places maintaining garages, stocks of tires were turned over to grocers, bakers, butchers, black-

industry will also be slow in getting under way and our manufacturers are organized and will see that the government protects their interests. Tire manufacturers and dealers here are continuing their efforts to obtain the unification and the reduction of the numbers of tire sizes.

RUBBER CLOTHING.

Manufacturers of rubber clothing are also feeling the pinch of war times, and recently a deputation from the industry sought an interview with the head of the War Materials Bureau, Berlin, to request the release of enough crude rubber to enable them to carry on their business. He replied that he would deal only with a central organization of the industry, and the manufacturers thereupon took steps to form such an organization, with a central bureau and distributing depot in Berlin. The members are pledged to obtain their supply of rubber solution from this depot, the distribution being based on the number of seamstresses employed. A kilogram of rubber, or its equivalent in rubber cement, for each 50 garment centers, is apportioned, and for this the manufacturer must pay cost, plus 7 per cent.

ARTIFICIAL LIMBS.

Many skilled workmen have lost a limb or limbs in the war, and our Association of German Engineers, realizing that these crippled workmen could still be made useful citizens, has offered a first prize of 10,000 marks [\$2,380] and a number of lesser prizes for improved artificial hands, arms and legs, that will enable maimed soldiers to be useful in the mechanical industries. The prizes will be awarded on February 1, 1916, by a jury composed of representative members of the technical, manufacturing, medical and orthopedic professions.

EMBARGO.

Our export embargo has been extended to cover all so-called rubberized materials, garments and the like, whether coated, impregnated or inlaid with rubber, or made up with rubber threads.

The controversy in regard to the placing of cotton on the contraband list by the Allies will be to some extent simplified by the action of the German Government in placing an embargo on all exports of raw or ginned, or otherwise manufactured cotton, yarns of cotton, with or without mixtures of vegetable or animal fibers (excepting silk and cotton thread and sewing thread), and coverings for hose, of woven cotton or flax.

In regard to the scarcity of rubber, I note in a recent issue of *THE INDIA RUBBER WORLD*, the French claim that E. Ronxville's reclaiming process is the secret of our being able to continue to use rubber tires, in spite of the fact that we have been cut off from sources of crude rubber supply for more than 12 months. This is an error. We have just as good, perhaps better, reclaiming processes than the Ronxville method, and we are clever enough to obtain some crude rubber from time to time. We admit that we are suffering from a scarcity of crude rubber that obliges us to collect waste rubber in every form, for reclaiming. The use of automobiles is now limited to the army and to physicians for use in attending to their increased practice, caused by the absence of many medical men called to the military service. But these are only precautionary measures, and the rubber question alone will not end the war. Our official and semi-official organizations for purchasing, collecting and conserving raw materials are doing wonders in distributing them judiciously and supplying any pressing needs which become manifest. As an example of the care these organizations take in the exercise of their duties: jute sacks, formerly used for shipping sugar, salt, cement, hops, etc., are no longer permitted to be used for such purposes, on account of the scarcity of jute. Barrels, cellulose sacks and metal containers are used instead.

"WAR QUALITY" RUBBER GOODS.

On the principle that "necessity knows no law," manufacturers and dealers handle and consumers use substitutes for raw ma-

terials and the finished product, without question. The food, clothing and other commodities we thus accept as an unavoidable result of the war would, in time of peace, be made of better and even altogether different materials.

Substitutes are used extensively in the rubber manufacturing industry, and rubber manufacturers, lacking a sufficient supply of raw material, are turning out war hose, war transmission and conveyor belts, war rubber garments, etc., etc. While not by any means as good as the regular lines, these "war qualities," as they are termed, answer their purpose and relieve us from absolute want.

An exhibition of substitutes was recently opened by the "Housewives' Association of Greater Berlin" to reassure the public by showing how completely the lines made from unavailable imported materials have been covered by resourceful manufacturers. There were substitute food supplies, raiment and other articles of everyday use, including, of course, substitute rubber articles in great variety, from garden hose to nipples for nursing bottles, squeezees, rubber sponges, etc.

TAXATION OF WAR PROFITS.

A topic much discussed here is the proposed special taxation of all profits made on contracts for supplies to the army and navy. The levying of such special taxes would be an injustice to manufacturers who have reorganized their plants and equipped them with special machinery for serving our defenders. No system of taxation could take account of the cost of these transformations, nor could it allow for what it will cost these manufacturers to return to their peaceful pursuits when the war is over.

AUSTRIA-HUNGARY.

We learn from Austria that the government has taken possession of all rubber tires, regardless of size, quality or condition. It is presumed that partly worn tires will be repaired and used for military purposes, while those past repairs and unsuited for army use will be reclaimed and re-manufactured for the government.

TRADE NOTES.

A recent meeting of the Vereinigte Gummiwaren-Fabriken Harburg-Wien, held in Hamburg, was attended by 18 shareholders, representing 1,968,900 marks [\$468,598] capital and 6,563 votes. An 18 per cent dividend was declared.

SCANDINAVIAN NOTES.

NORWAY, like some other neutral European countries, has been suffering from the effects of the British embargo on rubber and rubber manufactures. The automobile tire famine prevailing in Norway was mentioned in a recent issue of *THE INDIA RUBBER WORLD*. The situation has now been relieved, thanks to the joint efforts of the Association of Norwegian Automobile Tire Importers and the Royal Norwegian Automobile Club, who sent a delegate to London recently and obtained permission to import 9,000 automobile tires per annum into Norway.

The United Rubber & Air Ring Co., of Copenhagen, Denmark, recently acquired the rubber plantations of the Copenhagen East Asiatic Rubber Plantation Co., which are located near Utarah, in Johore, Malaya. These plantations produce sufficient quantities of crude rubber to supply all the demands of the United Rubber company's plant.

From Kjøge, Denmark, a correspondent writes that they are manufacturers of reclaimed rubber, but an embargo has been placed on the exportation of their products, except to neutral countries, nor can they purchase sufficient rubber waste to carry on their business, owing to the exportation of this material being prohibited by the warring nations; so they are making tires.

CEYLON AND MALAYA CROP PERCENTAGES AND RAINFALL.

THE Rubber Growers' Association, London, England, has issued two comprehensive charts and statements showing the percentages of crop harvested, and of rainfall recorded monthly by representative estates in Ceylon and Malaya. The figures are computed on annual crops of from 17 to 20 million pounds of Malaya rubber, and from five to seven million pounds of Ceylon rubber.

It appears from these charts that the wintering period, which occurs in February and March, coincident with the lowest rainfall, has a much greater effect on the crop of rubber in Ceylon than in Malaya; but the figures are no doubt

not show any extreme fluctuation, than in Ceylon, where as much as one-seventh of the year's crop is harvested in a single month.

The charts show that there is no great variation in crop percentages between 1913 and 1914 in either country.

COAGULATION OF LATEX.

A WRITER (L. E. C.) in the "Tropical Agriculturist" (October, 1915) submits some remarks on rubber latex coagulation. There seem to be several well-defined stages in the degree of coherence of rubber separated from latex. These are creaming, flocculence, agglutination and coagulation.

Creaming is the condition observed in the early stages of slow coagulation when the latex thickens.

Flocculence refers to the formation of small particles of rubber without coalescence into lumps. This state is observable in latex to which much formalin has been added.

Agglutination applies to local or lumpy coagulation observed when latex coagulates spontaneously, or when certain mineral salts are added.

Coagulation proper is the final stage observed on careful addition of acids to latex, the rubber forming in one clot and leaving a clear liquid.

In rubber latex there is a suspension of rubber particles which subsequently form rubber; also at the same time there is present, in solution, a number of bodies which are of the protein class. These proteins are in colloidal solution and are capable of being precipitated by certain reagents, notably acids. It seems probable that this protein acts as a protective colloid to the pure caoutchouc present. The theory of this protective action is that a combined solution and suspension, such as this, acquires many of the characteristics of the substance in colloidal solution. It has been suggested that this protective action is due to the absorption of a layer of the dissolved protective agent over the surface of each of the suspended particles. It seems probable that this is so in the case of the rubber particles, in view of the fact that it does not behave as a pure suspension, but that its coagulation reactions resemble in many respects those of certain proteins. Not all the nitrogenous constituents of latex, however, are precipitated with the rubber during the ordinary process of coagulation.

The effects of anti-coagulants involve the action of many factors. The anti-coagulant may be an alkaline substance acting to neutralize acid formed in the latex by decomposition or fermentation, or as a retarding agent on the coagulating enzyme said to exist in the latex. When formalin has been added to latex in certain proportions it apparently acts as a retarding agent, since the latex will retain its milky appearance and the rubber does not form a clot; but, actually, the latex loses its original nature and consists of a number of particles of rubber in suspension in a clear liquid. In this connection it may be noted that formalin is a coagulant of certain protein bodies.

In the coagulation of rubber latex by the Brazilian and other processes of smoking, the effect of heat enters very largely into the operations. In the Wickham process the author finds that, if the temperature of the jet of smoke impinging on the layer of latex be less than 140 degrees F., coagulation is not obtained. Heat alone, at this and slightly higher temperatures, will coagulate fresh latex. Latex heated to 140 degrees F. will coagulate with a certain quantity of acid almost immediately, whereas normally it would have required some hours.

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

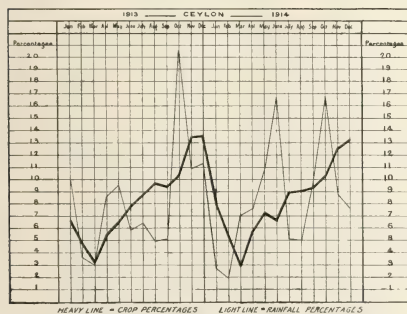
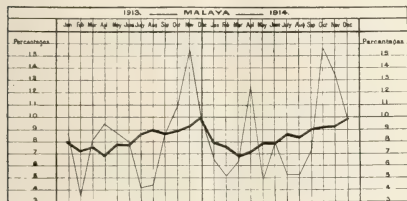


CHART SHOWING THE PERCENTAGE OF CROP HARVESTED, AND OF RAINFALL RECORDED MONTHLY IN 1913 AND 1914 BY REPRESENTATIVE ESTATES IN MALAYA AND CEYLON.

affected by the practice on some Ceylon estates of ceasing or reducing tapping operations during the wintering season. The variation in the daily distribution of rainfall in the respective countries and in the different districts must also be taken into account.

The heaviest yielding month in Ceylon produced more than four times the quantity of rubber harvested in the poorest month (13.30 per cent in December, 2.91 per cent in March, 1914) and the crop of the Ceylon estates for the first six months of 1914 was only 36.26 per cent of the total. In Malaya the fluctuations between highest and lowest yielding months are much less pronounced (9.94 per cent in December, 6.87 per cent in March, 1914), while in the first six months of 1914 the Malaya estates harvested 45.49 per cent of the total crop.

It would also appear that machinery and drying space required should be less in Malaya, where monthly outputs do

Rubber Planting Notes.

CEYLON FORWARD CONTRACTS FOR 1916 EXEMPT FROM TAX.

THE decision of the British Colonial authorities to place a duty of 10 shillings (\$2.42) per 100 pounds, or about 2.5 cents a pound, on all Ceylon rubber exports, was reported and commented upon editorially in the November issue of THE INDIA RUBBER WORLD.

Recent information shows that this decision has caused much unrest among the rubber buyers of Colombo, many of whom, as commission agents acting for principals in other countries, had contracted for future delivery of rubber still to be gathered and delivered month by month. The government's intention was to tax the producer, but the absence of any clause in the contracts for future delivery, relating to duty payments, caused the liability to fall on the buyer.

Meetings of buyers were held and much correspondence was exchanged between the Ceylon Chamber of Commerce and the Colonial Government with the result that the latter has consented to exempt, for a period not to extend beyond December 31, 1916, payment of the new tax on all rubber still to be delivered to shippers month by month under formal contracts entered into before October 1, 1915.

CRUDE RUBBER EXPORTS FROM SUMATRA.

The latest report published by the Chamber of Commerce of Medan, Sumatra, covers the first six months of 1915, and from it we have compiled the following table, showing the destination and quantities of crude rubber exported from Sumatra during this period:

To	pounds
London	4,918,232
United States	1,281,027
Netherlands	749,273
Singapore	292,081
Panama	267,429
Java	44,801
Other destinations	338,876
Total	7,833,219

A DISEASE OF MALAYA PLANTATION RUBBER.

A fungoid disease of plantation rubber in Malaya is the subject of Bulletin No. 22, of the Federated Malay States Department of Agriculture, by Mr. F. T. Brooks, M.A., who states:

This disease is caused by a fungus known as *Ustilina zonata* and is easily distinguished from root diseases caused by *Fomes scintosus*, *Sphaerostilbe repens* and *Hymenochaete noxia*. Its fructifications present themselves in the shape of greyish and blackish plates on the collar and on exposed lateral roots mostly of old rubber trees, though five-year-old trees are also attacked. It is believed that the fungus begins to grow on rotten roots, but in some cases it has been observed to follow attacks of white ants. The development of the disease can often be arrested by cutting off and destroying all discolored tissues when the fungus is in its early stages.

A rubber "goldbrick" is reported as offered for sale in the Far East, where the government of the Federated Malay States has issued a warning to "get-rich-quick" investors against the purchase, from designing individuals, of seeds of the "paint tree," said to yield a latex from which rubber-paint can be made. The seeds are those of a *Manihot*, the cultivation of which proved a failure in Malaya.

The Imperial Ethiopian Rubber Co., Limited, an English corporation that received from the Emperor Menelik of Abyssinia an exclusive concession for the collection and exportation of rubber, covering the whole of his empire, has been placed in liquidation. The monopoly was withdrawn in 1908.

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

MALAY PRODUCTION COSTS.

The following list, taken from "Grenier's Rubber News," Kuala Lumpur, shows the progress made by 20 leading companies in reducing the cost of producing plantation rubber during the past three years:

Plantations	1912	1913	1914
Batu Caves	36.6	25.5	18.6
Kapar Pata	36.1	29.8	19.8
Pataling	33.0	26.2	19.8
Selangor	34.0	27.7	20.1
Kuala Selangor	39.7	31.1	20.3
Straits Rubber	38.0	26.8	20.5
Sungei Kapar	35.9	27.1	20.8
Harpenden	36.6	30.7	21.8
Highlands	39.0	28.4	22.2
Seafeld	42.5	32.8	23.3
Nordang	37.5	32.1	23.3
Klanang	39.2	36.2	23.6
Keppong	48.4	33.3	24.1
Scottish Malay	43.3	26.9	24.1
Lanadron	47.6	38.9	24.3
Ledbury	40.6	30.5	24.3
Damansara	37.4	30.4	24.7
Gula-Kalumpang	50.5	36.5	24.9
Golconda	43.0	30.4	24.9
Anglo-Malay	41.1	30.3	25.3
Average cost	35.0	30.5	23.9

THE RUBBER PLANTATION INDUSTRY IN THE STRAITS SETTLEMENTS.

The total area under rubber cultivation in Malacca is 117,200 acres, and evidence of the steadiness and good future of the industry is shown in recent reports from the Far East, which state that various rubber estates throughout the country are opening up fresh areas to rubber plantations.

It has long been a practice in the Straits Settlements' plantations to interplant rubber with tapiooa. Now, however, these catch crops under rubber are being abandoned.

VIEWS OF R. DERRY ON HEVEA PLANTING.

In a paper on the "Life of a Rubber Estate," R. Derry, ex-officer of the Federated Malay States Agricultural Department, sets forth in detail a plan to utilize the advantages of different methods in *Hevea* planting. In part, Mr. Derry states that the primary tree is the best form to cultivate but that in close planting this advantage is lost, owing to the fact that in the struggle for light the strong branches do not develop. The "pollard" tree is a fast grower and bears early, but is the first exploited. Early tapping is necessary, but injurious to subsequent growth, leading to early exhaustion of the estate. Mr. Derry advises planting one set of permanent, primary trees wide apart and leaving them untapped; at the same time inter-planting another set of subsidiary, pollard trees, to be kept pruned and brought into bearing early. The primary trees should be left untapped for the term of the subsidiary crop—10 to 11 years after transplanting.

PRUNING RUBBER TREES ON PLANTATIONS.

Writing on the subject of wholesale pruning of rubber trees, as practiced on Malayan plantations, an expert correspondent of our Far Eastern contemporary, the "Malay Mail," is of the opinion that it is not good practice unless carried out with sufficient discrimination. On many plantations the lower branches of trees are removed, not only from closely planted trees where the branches have met, but also on open plantations where the trees have not yet completely shaded the ground. Indiscriminate pruners are guided more by routine than by the theory that the lower branches which they destroy prevent light and air reaching the tree stems, thus retarding the growth of the plants. In closely planted areas the additional shade provided by lower branches may preserve humidity and thus retard bark renewal

on tapped areas and increase the risk of fungoid diseases. But, generally speaking, indiscriminate pruning is more likely to retard than to hasten bark renewal because the bark is formed from within the tree, not from without. The leaves create the substances the tree uses for repairing its bark wounds and, therefore, to lessen the number of leaves, which is often the clearest result of pruning, is to decrease the tree's output of bark-renewing substances. Branches that are useless will, as a rule, be shed spontaneously by the tree. Reasons for pruning may be sound in the particular case of an individual tree, but they do not justify the indiscriminate sacrifice of branches as practiced generally on the Malayan plantations.

CHICLE DISPLACING RUBBER IN VENEZUELA.

The British consul at Ciudad Bolivar reports that the balata industry of Venezuela reached its high-water mark in 1913, and quotes the following export statistics as proof of the beginning of a decline in the industry:

	1913.		1914.	
	Pounds.	Value.	Pounds.	Value.
Balata	4,851,004	\$2,018,029	1,511,944	\$557,603
Rubber	413,004	750,326	339,416	152,073

In comparison with this decline, which the consul attributes to the decreasing profitability of rubber gathering and the development of other fields of employment for labor, the production and export of chicle, which is sold to the United States for the manufacture of chewing gum, has increased almost five times.

HEVEA AND HURRICANES IN JAMAICA.

WERE it not for hurricanes, Jamaica would show up well for *Hevea* culture. There are but few plots of rubber—100 trees here, 60 there, and so on. The product is good and



Hevea, 7½ YEARS OLD, JAMAICA.

abundant. In the tapped tree shown, a tree 7½ years old, one pound of first-grade rubber was secured in three months, tap-

ping every other day. But the plantation upon which this grew lost 50 per cent of its trees in a recent hurricane. The twisted



Hevea TREE DESTROYED BY A HURRICANE, JAMAICA.

stump of the *Hevea* here shown is eloquent evidence of force of the wind. In a few of the near-by islands protected from wind, and in Central America and the Guianas, for example, *Hevea* does as well, perhaps better, than in a great many places where it is now grown on a large scale.

BALATA EXPORTS FROM FRENCH GUIANA.

Statistics for the fiscal year 1914-15 show that the total exports of crude balata from French Guiana during this period amounted to 52,274.50 kilograms (115,004 pounds), as compared with 41,694.50 kilograms (91,728 pounds) exported during the preceding fiscal year.

BALATA EXPORTS FROM DUTCH GUIANA.

Exports of balata from Dutch Guiana, from January to September, 1915, amounted to 120,050 kilograms (264,110 pounds), as compared with 639,469 kilograms (1,406,832 pounds) exported during the corresponding period of 1914.

CRUDE RUBBER INDUSTRY IN LIBERIA.

Frequent mention has been made in THE INDIA RUBBER WORLD of the crude rubber industry in Liberia. Recent reports from the African republic state that the exports of crude rubber, though comparatively small, are steadily increasing, thanks to the organized methods of the British association in which is vested the supervision of the rubber royalties throughout the republic. A subsidiary of this association now has a plantation of about 1,100 acres containing 135,000 *Hevea* trees, the majority of which are producing; and the entire plantation will have reached maturity by the tapping season of 1916. This plantation was started about six years ago, on strictly modern lines, from seed received from the Botanic Gardens of Ceylon, and has constantly been under expert supervision. All of Liberia's rubber goes to Great Britain.

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED NOVEMBER 16, 1915.

- N^{O.} 1,160,159. Skating over-shoe. L. Freeman, Montreal, Quebec, Canada.
- 1,160,168. Valve connection for pneumatic tire tubes. A. E. Henderson, Toronto, Ontario, assignor to Superior Tubes & Accessories, Limited—both in Canada.
- 1,160,206. Tread surface for footwear. R. Smith, Sherbrooke, Quebec, Canada.
- 1,160,214. Sanitary device. B. G. Therese, Chicago, Ill.
- 1,160,220. Demountable rim tool. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York.
- 1,160,221. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York.
- 1,160,222. Vehicle wheel and rim. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York.
- 1,160,223. Vehicle wheel. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York.
- 1,160,224. Vehicle wheel. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York.
- 1,160,225. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York.
- 1,160,226. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York.
- 1,160,252. Life preserver. W. G. Brokaw, High Point, N. C.
- 1,160,253. Life preserver. W. G. Brokaw, High Point, N. C.
- 1,160,254. Tire supporting rim. R. S. Bryant, assignor to The Standard Welding Co.—both of Cleveland, Ohio.
- 1,160,272. Tire filler core. L. J. Frederickson, Kansas City, Mo.
- 1,160,310. Pneumatic tire. J. W. Mosler, assignor of one-half to N. S. Wright—both of East Worcester, N. Y.
- 1,160,323. Vehicle wheel tire. J. I. Richards, San Francisco, Cal.
- 1,160,334. Intermediate shield for pneumatic tires. J. B. Smiley, South Omaha, Neb.
- 1,160,424. Pneumatic tire. C. E. McClay, Los Angeles, Cal.
- 1,160,491. Storage battery. P. Brown, Springfield, Mass.
- 1,160,568. Vehicle tire. J. Hay, Pittsburg, Pa.
- 1,160,551. Bottle washer brush. C. K. Volkening, New York.
- 1,160,576. Flexible non-skid device for dual tired wheels. M. H. Cleaver, assignor to Neverskid Manufacturing Co., Inc.—both of New York.
- 1,160,577. Combined non-skid and traction device for dual tired wheels. M. H. Cleaver, assignor to Neverskid Manufacturing Co., Inc.—both of New York.
- 1,160,631. Pneumatic shoe tree. E. H. Magnus, Toledo, Ohio.
- 1,160,712. Inflation valve for pneumatic tires. A. E. Henderson, Toronto, Ontario, assignor to Superior Tubes & Accessories, Limited—both of Canada.
- 1,160,797. Nasal inhaler. K. F. Wallin, New York.
- 1,160,873. Canvas shoe. S. Frankenburg and F. H. Betteridge—both of Salford, England.
- 1,160,944. Hose coupling. F. K. Müller, assignor to Republic Hose Coupler Corporation—both of Buffalo, N. Y.
- 1,160,953. Pessary. A. M. Palmer, Los Angeles, Cal.
- 1,160,977. Demountable rim for automobile wheels. W. E. Copithorn, Natick, Mass.

ISSUED NOVEMBER 23, 1915.

- 1,161,061. Eye shield. R. Malcolm, Chicago, Ill.
- 1,161,102. Pneumatic shock absorber. W. G. Wood, Sacramento, Cal.
- 1,161,103. Truss. C. G. Woods, assignor of one-half to J. F. Leachey—both of St. Louis, Mo.
- 1,161,107. Hose supporter. R. V. Blake, Yonkers, N. Y.
- 1,161,123. Fountain pen. J. Gilbert, Victoria, British Columbia, Canada.
- 1,161,247. Resilient tire. E. W. Price, Toronto, Ontario, Canada.
- 1,161,250. Eraser brush. F. D. Roberts, Montclair, assignor to Weldon Roberts Co.—both in New Jersey.
- 1,161,261. Catheter apparatus. J. F. Spaulding, Kansas City, Mo.
- 1,161,348. Wheel rim. M. J. Selzer, Akron, Ohio.
- 1,161,507. Armored pneumatic tire. C. Moss, New York.
- 1,161,549. Tire tread. T. B. Tiefenbacher, New York.
- 1,161,578. Dust cap for tire valves. E. A. Alexander, assignor to C. A. Herlie—both of Rochester, N. Y.

- 1,161,641. Air hose coupling. W. Engle, Taylor, Wash.
- 1,161,645. Tire protector for motor vehicles. G. A. Faber, Baltimore, Md.
- 1,161,654. Rubber fly swatter. G. W. Gomber, Conyngham, assignor to Standard Venting Machine Co., Hazleton—both in Pennsylvania.
- 1,161,698. Separable rim. P. S. Larson, assignor of one-half to J. B. Low—both of Beloit, Wis.
- 1,161,719. Massage glove. W. R. Norton, Hightstown, N. J.
- 1,161,720. Waterproof boot or shoe. C. A. Paige, Norwood, assignor to C. S. Bird, Walpole—both in Massachusetts.
- 1,161,725. Vaccine container comprising a rubber bulb. P. S. Pittenger, assignor to H. K. Mulford Co.—both of Philadelphia, Pa.
- 1,161,728. Safety cap for tire valves. E. A. Rasbridge, Scranton, Pa.

ISSUED NOVEMBER 30, 1915.

- Fountain syringe. G. W. Brown, Maynard, Mass.
- 1,161,836. Heel construction for rubber footwear. F. E. Payne, assignor to Goodyear Rubber Co.—both of Middletown, Conn.
- 1,161,879. Resilient wheel with rubber blocks. S. S. Wells, Short Hills, N. J.
- 1,162,004. Resilient wheel. S. S. Wells, Short Hills, N. J.
- 1,162,005. Resilient wheel with cushioned spokes. W. W. Krutch, assignor of one-half to C. A. Walker—both of Coffeyville, Kans.
- 1,162,078. Vehicle wheel. W. W. Krutch, assignor of one-half to C. A. Walker—both of Coffeyville, Kans.
- 1,162,079. Vehicle wheel. W. W. Krutch, assignor of one-half to C. A. Walker—both of Coffeyville, Kans.
- 1,162,080. Rubber padded garment supporter loop. C. P. Kuehn, assignor to A. Stein & Co.—both of Chicago, Ill.
- 1,162,081. Life preserver. J. E. Lomas, Smuggler, Colo.
- 1,162,099. Tire valve cap. M. F. Patton, Tuscaloosa, Ala.
- 1,162,143. Wheel tire. J. L. Donat, Chicago, Ill.
- 1,162,158. Solid rubber tire. E. A. Haaker, Englewood Cliffs, N. J.
- 1,162,188. Tire with elastic ribs and plugs. P. W. Pratt, Boston, Mass.
- 1,162,216. Detachable flange for pneumatic tire rims. W. N. Booth, assignor to The Booth Demountable Rim Co.—both of Cleveland, Ohio.
- 1,162,217. Detachable tire holding ring. W. N. Booth, assignor to The Booth Demountable Rim Co.—both of Cleveland, Ohio.
- 1,162,254. Rim for vehicle tires. J. G. Rolf, Covington, Ky.
- 1,162,260. Elastic waste closure. J. Sklar, Philadelphia, Pa.
- 1,162,321. Pneumatic tire. W. E. Travers, assignor of one-half to E. E. Travers—both of Oakland, Cal.
- 1,162,379. Demountable rim for solid tires. T. Midgley, assignor to Morgan & Wright—both of Detroit, Mich.
- 1,162,445. Composite sole with a rubber tread. W. F. Bostock, Providence, R. I., assignor to Williams-Kneeland Co., Boston, Mass.
- 1,162,470. Tire rim contractor. A. A. Friedstedt, Chicago, Ill.
- 1,162,525. Suit for divers. H. Stelner, assignor to the Firm of Drägerwerke, Heimr. & Bernh. Dräger—both in Lübeck, Germany.
- 1,162,557. Fountain pen. C. F. Bakla, Cedar Rapids, Iowa.
- 1,162,563. Demountable rim. R. S. Bryant, assignor to The Standard Welding Co.—both of Cleveland, Ohio.
- 1,162,568. Urethral supporter. D. G. Carey, Elmira, N. Y.
- 1,162,610. Life saving belt. A. Jacobson and H. Rubin—both of New York.
- 1,162,668. Safety valve and tire signal. H. E. Van Ness, Elmira, N. Y.
- 1,162,671. Pneumatic tire. I. J. Webster, Haverhill, Mass.
- 1,162,709. Cushion heel. A. K. Pomeroy, Williamstown, N. J.

Re-issue.

- 14,024. Water bag. R. B. Whitmarsh, Los Angeles, Cal.

ISSUED DECEMBER 7, 1915.

- 1,162,744. Valve for pneumatic tires. J. W. Blodgett, Chicago, Ill.
- 1,162,749. Pneumatic tire. W. H. Burritt, assignor to J. T. Burritt—both of St. Louis, Mo.
- 1,162,758. Air expending device in a pneumatic tired wheel. W. S. Estle, New York, N. Y.
- 1,162,786. Rubber stamp for printing characters of multiple colors. W. Kieck, Albuquerque, N. Mex.
- 1,162,852. Flexible ball tank valve of rubber. W. J. Eggers, New York, N. Y.
- 1,162,875. Valve for pneumatic tires. M. J. Payne, Staunton, Va.
- 1,162,900. Vehicle tire. B. H. Brown, Manon, Ind.
- 1,162,909. Life preserver. E. Goldbach, Winfield, N. Y.
- 1,162,979. Demountable tire. J. H. Coffey, Jr., and J. H. Coffey, assignors of one-half to Gutta Percha & Rubber, Limited—all of Toronto, Ontario, Canada.
- 1,163,000. Vehicle tire. C. E. Forster, Oak Park, Ill.
- 1,163,001. Belt cleaner comprising a block of rubber. R. S. Gibson, Lockhart, S. C.
- 1,163,055. Collapsible demountable tire. H. W. Wirtz, Los Angeles, Cal.
- 1,163,151. Tire holding rim for wheels. H. L. Hosterman, Parkersburg, W. Va.
- 1,163,195. Spring wheel with rubber tread. P. A. Angeski, Lilly, Pa.

- 1,163,219. Means for inflating pneumatic tires. F. J. Cleaver, Carnegie borough, Pa., assignor to S. L. H. Morris; one-fourth to H. W. Hodgdon, and one-fourth to E. T. Baron, Pittsburgh, Pa.
- 1,163,257. Collapsible tire rim. A. L. Ottenad, St. Louis, Mo.
- 1,163,258. Vehicle wheel with rubber tread. W. H. Parkham, Knoxville, Tenn.
- 1,163,311. Non-skid tire. P. Bernstein, Roxbury, Mass.
- 1,163,319. Fountain tooth brush. W. O. Campbell, St. Louis, Mo.
- 1,163,338. Pneumatic tire. W. D. Harris, assignor to Harris Tire & Rubber Co.—both of Philadelphia, Pa.
- 1,163,343. Rubber coated hair curler. N. Iloway, New York, N. Y.
- 1,163,368. Doll having an inflatable air receiving element within head. S. H. Rodsky, Port Richmond, N. Y., assignor of one-half to A. Cone, Toronto, Canada.
- 1,163,395. Arch support. E. P. Cushman, Methuen, Mass.
- 1,163,408. Tire armor. S. Hunter, Syracuse, N. Y.
- 1,163,456. Operating device for split wheel rims. D. J. Raymond, Cranston, Wt.
- 1,163,478. Door stop. J. H. Snow, Indianapolis, Ind., assignor to A. Y. Wright, Douglas, Ariz.
- 1,163,490. Toe separator. A. Weil, New York, N. Y.
- 1,163,518. Tire armor. E. Farr, Lancaster, Ohio.
- 1,163,567. Needle for talking machines having rubber vulcanized to its shank. L. K. Scotland, Chicago, Ill.
- 1,163,577. Rim for vehicle wheels. P. S. Whiting, Akron, Ohio, assignor to M. E. Whiting, Wayne county, Mich.
- 1,163,619. Chain tire grip. W. B. Lashar, assignor to American Chain Co., Inc.—both of Bridgeport, Conn.
- 1,163,630. Tire grip. W. B. Lashar, assignor to American Chain Co., Inc.—both of Bridgeport, Conn.

UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent upon the filing of the application.

*Denotes Patents for American Inventions.

- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, NOVEMBER 10, 1915.]
- 16,291 (1914). Size adjusting rubber hat band. W. L. Jordan, 66 Bassett Park Road, Shepherd's Bush, London.
- *16,346 (1914). Hammer, with rubber head. J. Davis, Erie, Pennsylvania.
- 16,366 (1914). Rubber impregnated diaphragm for cow milkers. A. Sabroe, Haderley, Kent.
- 16,373 (1914). Elastic hat band. M. M. Kempley, and E. Beaugard, 30 Cromwell Grove, West Kensington Park, London.
- *16,382 (1914). Rubber parts for pipe couplings and valves. E. J. Rohrbacher, 701 East Pike street, Seattle, Washington.
- 16,403 (1914). Rubber tubes in sheet piling joints. E. W. Moir, 10 Victoria street, Westminster.
- *16,475 (1914). Rubber former for producing a raised pattern on felt hats, etc. A. Turner, Danbury, Connecticut.
- *16,579 (1914). Spring wheels with continuous outer resilient suspension ring. W. A. Leet, A. White, and A. H. Shoemaker—all of 402 Panama Building, Portland, Oregon.
- *16,596 (1914). Inflatable pneumatic tubes in life boat construction. J. Kertesz, 110 Madison street, Pittstown, Pennsylvania.
- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, NOVEMBER 17, 1915.]
- 16,645 (1914). Vacuum cleaning apparatus. C. E. Cherry, 401 Anlaby Road, Kensington-upon-Hill.
- 16,715 (1914). Tire protector. H. G. Powell, "The Myrtles," Mellish Road, Walsall.
- 16,740 (1914). Elastic band closure for military coat yoke pockets. E. Court, 50 Osselt Road, Wakefield, Yorkshire.
- 16,772 (1914). Tire with elastic covering. E. Sandow, 32 St James' street, London.
- 16,789 (1914). Detachable rim attachments. H. Wade, 111 Hatton Garden, London.
- 17,019 (1914). Tire attachments to rims. R. T. Smith, 111 Lovely Lane, W. W. Kingston, Lancashire.
- 17,035 (1914). Securing solid rubber tires to rims. M. Polack, Waltershausen, Gotha, Germany.
- 17,045 (1914). India rubber apparatus for aerating liquids. Akt.-Ges. Metzeler & Co., Westendstrasse, Munich, Germany.
- 17,150 (1914). Toy projectile having a rubber head. H. Sauer, 5 Fuchsstrasse, Nürnberg, Germany.

- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, DECEMBER 1, 1915.]
- 17,614 (1914). Elastic garter. F. Dawkins, 64 Belgrave Gardens, Chester Road, Walsley, London.
- *17,631 (1914). Elastic fabric for corsets. W. Kops, 409 West End avenue, Manhattan, New York.
- *17,637 (1914). Valve comprising a rubber face. W. H. Taylor, 503 Market street, San Francisco, and I. L. Peterson, Burlingame—both in California.
- *17,642 (1914). Dress shield. V. Guinzburg, 725 Broadway, Manhattan, New York.
- 17,647 (1914). Rubber in joint-making packing. J. T. Bilson, Upper Toll street, North Shields, Northumberland.
- 17,660 (1914). Golf shoe. S. Wolfe, Ltd., 400 Oxford street, and L. H. Norton, 38 Midway Park—both in London.
- 17,666 (1914). Non-skid devices. J. Kopecky, 1113 Herick avenue, Racine, Wis.
- 17,740 (1914). Improvement in teat cup for cow milkers. J. Wilaert, Mount Hobson Road, Remuera, Auckland, New Zealand.

- 17,766 (1914). Pneumatic tire. D. R. Shewan, 1541 22nd avenue East, Vancouver, Canada.
- 17,815 (1914). Rubber in sanitary traps. J. Murphy, 223 School Road, Crookes, Sheffield.
- 17,883 (1914). Apparatus for washing drinking vessels. J. C. Sumner, 145 Church street, Preston, Lancashire.

NEW ZEALAND.

- [ABSTRACTED IN THE PATENT OFFICE JOURNAL, OCTOBER 28, 1915.]
- 36,239 (1915). Combined tire valve and patch of india rubber. C. E. Baker, 34 Blue street, Carmarthen, Wales.
- 36,258 (1915). Pneumatic tire cover reinforcement or repair. F. W. Farr, Reclaim Works, Henry street, Northampton, England.
- 36,599 (1915). Hollow rubber valve in closet flushing apparatus. R. W. H. Ramsay, Palmerston North, New Zealand.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

- 476,791 (December 17, 1914). Method of protecting auto tires. R. di Martino (December 22). Pneumatic vehicle wheel. G. R. Taylor and R. Whyte.
- 476,866 (November 11). Mudguard for automobiles. W. Curtis.
- 476,875 (May 13). Improvement in shock absorbers for aeroplanes. R. Esnault-Pelterie.
- 476,924 (December 30). Wheel for road vehicles. O. E. S. Huss.
- 477,018 (January 4, 1915). Improvement relating to pneumatic tire rims. The Dunlop Rubber Co., Limited, and J. V. Worthington.

[NOTE.—Printed copies of specifications of French patents can be obtained from R. Boudier, Ingenieur-Conseil, 16 avenue de Villiers, Paris, at 50 cents each, postpaid.]

TRADE MARKS.

ISSUED NOVEMBER 16, 1915.

- 81,489. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The words *Yakon Masher*. For footwear of rubber or in combination with other materials.
- 88,176. The Tire Store, Greensburg, Pa. Illustration of a truncate pyramid. For tires, inner tubes, bicycle tires composed of rubber and fabric or rubber or fabric.
- 88,532. C. A. Crane, Cleveland, Ohio. The word *Auto-O-Mint*. For chewing gum, etc.
- 88,983. Globe Rubber Tire Manufacturing Co., Inc., Trenton, N. J. Representation of a globe with the word *Globe*. For rubber tubes and tires.
- 89,446. E. W. Reck, Boston, Mass. The word *Exersizer*. For footwear made of rubber.
- 89,473. United & Globe Rubber Manufacturing Cos., Trenton, N. J. The word *Efficiency*. For rubber hose, rubber belting, rubber valves, rubber packings, etc.
- 89,544. H. Goldman & Co., Inc., New York. The word *Tour-Rain*. For coats.
- 89,890. The Mechanical Rubber Co., Jersey City, N. J.; Cleveland, Ohio, and New York. Representation of a bench vice. For friction tape.

ISSUED NOVEMBER 23, 1915.

- 88,343. Seabury & Johnson, East Orange, N. J., and New York. Representation of a gold Maltese cross. For impermeable surgical dressings, guth percha tissue, mackintosh cloth, etc.
- 88,344. Seabury & Johnson, East Orange, N. J., and New York. The words *Gold Cross Brand*. For impermeable surgical dressings, guth percha tissue, mackintosh cloth, etc.
- 88,956. Goodyear's India Rubber Glove Manufacturing Co., New York, and Naugatuck, Conn. The word *Atos*. For water bottles, syringes and combinations of the two.
- 89,523. J. H. Price, Columbus, Ohio. The words *Strides Righter*. For rubber and leather shoes for men and women.
- 89,583. M. L. Margol, New York. The word *Meridia*. For armbands.
- 89,769. O'Sullivan Rubber Co., Portland, Me., and New York. The words *Next To Wings*. For rubber heels for boots and shoes.

ISSUED NOVEMBER 30, 1915.

- 89,199. Traveller Tire & Tube Co., Inc., New York, N. Y. The word *Traveller*. For rubber valves and tubes.
- 89,581. Alfred A. Kohn, New York, N. Y. Illustration of a wheel cart tandem. For boots and shoes of leather, cloth and rubber.
- 89,931. A. S. G. & Co., Chicago, Ill. Illustration of a gentleman putting on a garter. For garters.

ISSUED DECEMBER 7, 1915.

- 87,843. Goodyear Rubber Co., Middletown, Conn. The words *Tri-Sole Steward*. For rubber boots and shoes.
- 88,174. Remort Manufacturing Co., Seattle, Wash. The word *Remort*. For rubber valve packing or gaskets.
- 89,157. Oneida Community, Limited, Oneida, N. Y. The word *Community*. For fountain pens, rubber pens, rubber combination erasers, etc.
- 89,324. The Rubber Products Co., Barberton, Ohio. The word *Stronghold*. For elastic vehicle tires.
- 89,532. Revere Rubber Co., Providence, R. I. The word *Nobby*. For rubber horseshoe pads.
- 89,884. I. W. Hoyer, Philadelphia, Pa. The word *Uni-Fast Aid*. For a synthetic rubber compound to be used in the waterproofing of textile fabrics.

DESIGNS.

ISSUED NOVEMBER 16, 1915.

- 48,150. Toy balloon. F. F. Brucker, assignor to The Miller Rubber Co.—both of Akron, Ohio.
- 48,159. Bowl for fountain syringes. R. B. Newcome, Amarillo, Tex.
- ISSUED DECEMBER 7, 1915.
- 48,244. Elastic vehicle tire. M. J. Del Grego, Akron, Ohio.
- 48,427. Vehicle tire. M. J. Gillen, Cleveland, Ohio, assignor to The Standard Tire & Rubber Manufacturing Co., a corporation of Ohio.
- 48,253. Tire tread or similar article. J. S. Patterson, Boston, assignor to Needham Tire Co., Needham—both in Massachusetts.

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

BUSINESS in heavy chemicals, pigments and fillers was good during December and prices in all lines were steady. The advances made during November have been maintained in practically every instance. Pig lead was quoted at 5½ cents per pound, most of the month, advancing in the fourth week to 5.4 cents per pound. There was no immediate corresponding rise in the lead products, although it may be expected shortly.

The soda situation is described as exceedingly strong, with the basic material in an oversold condition. The supply of caustic soda is short.

There is an enormous demand for sulphuric acid, and prices are nominal. The official valuation of sulphuric acid exported in September of 1915 is \$93,664, while that corresponding for September a year ago is \$4,682. Valuations of sulphuric acid exportations for corresponding nine months' period ending September 30 were, for 1914, \$70,705; for 1915, \$774,747—an increase of about 996 per cent.

The conditions of last month still obtain with regard to prices and supply of lithopone and zinc oxides, both foreign and domestic. Aniline (spot) is declining somewhat, although still excessively high. Benzol is practically unobtainable. Solvents are higher than a month ago.

The supply of chalk for whiting manufacture is short and prices uncertain.

Barytes remain very steady, at slightly higher prices than a month ago. Domestic sources are supplying the entire American demand.

Future supplies of some materials are uncertain, and therefore consumers have no reliable basis for calculating costs. In the case of lead and zinc pigments, prices are fairly well defined for the first half of 1916.

PRICES OF CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK, DECEMBER 30, 1915.

Subject to change without notice.

Acetone (drums)	lb.	\$0.35	@ \$0.40
Acid, acetic, 28 per cent. (bbls.)	lb.	.06	@ .07
glacial, 99% (carboys)	lb.	.30	@ .35
Aluminum flake (carloads)	ton	18.00	@ 20.00
Ammonium carbonate		None	
Antimony, crimson, sulphuret of (casks)	lb.	.80	@ .85
golden, sulphuret of (casks)	lb.	.65	@ .70
Asbestos	ton	19.00	@ 20.00
Asbestos "CM" Brilliant	lb.	.04	@ .05
Barium sulphate, precipitated	ton	120.00	@
Barytes, pure white	ton	19.50	@ 21.00
or color	ton	17.50	@
Basoform	ton	120.00	@
Benzol, pure	gal.	.80	@
Beta-Naphthol	lb.	None	
Black Hypo	lb.	.39	@ .40
Bone ash	lb.	.10	@
black	lb.	.0215	@ .10
Cadmium tri-sulphate		None	
yellow		None	
Canella gum	lb.	.2715	@ .35
Carbon, bisulphide (drums)	lb.	.0775	@ .08
black (cases)	lb.	.08	@ .15
tetrachloride (transit)	lb.	.18	@
Caustic soda, 76 per cent. (bbls.)	cask	6.00	@ 7.00
Chalk, precipitated, extra light	lb.	.05	@
China Clay, domestic	ton	13.50	@ 15.00
imported	ton	22.00	@ 24.00
Chrome, green	lb.	.10	@ .12
yellow	lb.	.15	@ .20
Coal tar	gal.	.09	@
Cotton linters	lb.	.07	@ .12
Emarex	ton	70.00	@
Gas black	lb.	.075	@
Gilsonite (C. P. drums)	ton	37.50	@ 42.50
Glycerine (C. P. drums)	ton	53.00	@ 56
Graphite, flake (250 to 400 pound bbl.)	lb.	.175	@
powdered (250 to 400 pound bbl.)	lb.	.175	@
Green oxide of chromium (casks)	ton	.30	@ .42

Ground glass	lb.	\$0.0215	@ \$0.07
Iron oxide, red, reduced grades	lb.	.0215	@ .0515
red, pure	lb.	.0515	@ .09
Infusorial earth, powdered	ton	50.00	@
boiled	ton	60.00	@
Ivory, black	lb.	.08	@ .12
Indian red	lb.	.0315	@ .07
Lampblack	lb.	.04	@ .08
Lead, red oxide of	lb.	.0715	@ .0715
sublimed blue	lb.	.0575	@ .0615
white, basic carbonate	lb.	.06	@ .0615
white, basic sulphate	lb.	.06	@ .0615
Lime, flour	lb.	.61	@ 0.15
Litharge	lb.	.0615	@ .0615
English	lb.	None	
Lithopone, domestic	lb.	.0815	@ .10
imported	lb.	.0815	@ .1015
Magnesia, carbonate	lb.	.0515	@ .06
calcined, heavy	lb.	.11	@
light	lb.	.25	@ .2715
Magnesite, calcined, powdered	ton	50.00	@ 60.00
Mica, powdered	lb.	.0315	@ .05
Mineral rubber	lb.	.0115	@ .0415
Naphtha, stove gasoline (steel bbls.)	gal.	.21	@
68 to 68 degrees	gal.	.25	@
68 to 70 degrees	gal.	.26	@
Oil, aniline	lb.	1.10	@ 1.40
linseed (bbl.)	gal.	.65	@ .67
palm	gal.	.0815	@ .0815
pine (cases)	gal.	.60	@
rosin, heavy body	gal.	.32	@ .36
tar (cases)	gal.	.25	@ .30
soluble aniline colors, yellow, orange, red, violet, blue, green	lb.	3.00	@ 3.50
Orange mineral, domestic	lb.	.0615	@ .0915
Paraloid	lb.	.07	@
Petroleum grease	lb.	.04	@
Pine tar, retort	gal.	.14	@ .16
Pitch, burgundy	lb.	.0415	@ .0515
pure	lb.	.0215	@
Plaster of paris	lb.	1.50	@ 1.70
Prussian blue	lb.	1.50	@ 1.75
Pumice stone, powdered (bbls.)	lb.	.02	@ .03
Resin, Pontianak, refined	lb.	.10	@
granulated	lb.	.11	@ .12
fused	lb.	.10	@
Rosin (500 pound bbls.)	lb.	5.50	@ 8.65
Rotten stone, powdered	lb.	.0215	@ .04
Rubber black	lb.	.03	@
Rubber substitute, black	lb.	.0715	@ .08
white	lb.	.10	@ .13
Shellac, fine orange	lb.	.25	@ .28
Sapstone, powdered	ton	19.00	@ 22.00
Starch, corn, powdered	lb.	.02	@ .0215
Sulphur chloride (drums)	lb.	.08	@ .0815
Sulphur, flowers	ton	.20	@ 2.60
Sulphuric acid, 66°	lb.	.02	@ .0215
Talc, American	ton	8.50	@ 13.00
French	ton	18.00	@ 25.00
Toluol, pure	gal.	5.00	@
Triplite earth, powdered	ton	50.00	@
boiled	ton	60.00	@
Turpentine, pure gum spirits	gal.	.5415	@ .55
wood	gal.	.50	@
Ultramarine, blue	lb.	.09	@ .28
Vermilion, brilliant	lb.	.90	@ 1.00
Chinese	lb.	.22	@ 2.25
English	lb.	2.10	@ 2.15
Wax, bayberry	lb.	.22	@ .24
beeswax, white	lb.	.47	@ .55
ceresine, white	lb.	.12	@ .16
caruba	lb.	.22	@ .47
ozokerite, black	lb.	.40	@
green	lb.	.60	@ .75
montan	lb.	.28	@
paraffin, refined, 118-120 m. p. (cases)	gal.	.0415	@
121-125 m. p. (cases)	gal.	.0415	@
128-130 m. p. (cases)	gal.	.0515	@
133-136 m. p. (cases)	gal.	.0615	@ .0615
crude, white, 117/119 m. p. (bbls.)	lb.	.0315	@
yellow, 124-126 (bbls.)	lb.	.0315	@
Whiting, Alta, factory	ton	7.00	@ 8.50
commercial	ton	.55	@ .65
XX red	ton	.65	@ .75
Paris white, American	ton	.85	@ .95
English cliffstone	ton	.90	@ 1.25
Wood pulp, XXX	ton	30.00	@
Yellow ochre	lb.	.02	@ .0215
Zinc oxide, American process, horsehead brand	lb.	.09	@ .0915
special	lb.	.0815	@ .0815
French process, green seal	lb.	.1615	@ .1615
red seal	lb.	.16	@ .1615
white seal	lb.	.17	@ .1715
Zinc oxide, imported, white seal	lb.	.28	@
Zinc sulphate, pure	lb.	.0715	@ .14

Review of the Crude Rubber Market.

NEW YORK.

DECEMBER 30, 1915.

DECEMBER, 1915, will be remembered in the trade for the remarkable advances in prices it witnessed, gains of 25 cents per pound for First latex and 20 cents for Upriver fine being recorded, with the market still strong, and with an upward tendency at the end of the month. The forecast of \$1 rubber is already realized, and the present tone of the market indicates that \$1.10 may be reached before long—the highest price quoted since January 1, 1913.

The grounds on which this forecast was based are qualified to affect a market as sensitive as that for crude rubber, and in reality are those on which the forward movement that started early last November was founded. When it is considered that it has resulted thus far in the phenomenal gain of 38 cents per pound in plantation rubber, which was aided by recent rumors of interference with plantation shipments, threats of labor troubles in the Far East, menaces to rubber carriers and fear of an ultimate shortage of plantation rubber, the appearance of a prophet who could truly elucidate the peculiar possibilities of this market would be welcome.

First latex spot was quoted on December 1 at 75 cents, January to March deliveries at 73 cents and January to June deliveries at 71 cents. Upriver fine spot was firm and prices were moving steadily upward when the cables brought the news of the sinking of the steamship "Langton Hall" in the Mediterranean with 500 tons of rubber. This sufficed to demoralize the market, and new levels were established with First latex spot selling at 84 cents, January to June 77 cents and Upriver fine 69 cents.

Encouraged by heavy buying in London the upward movement continued as the month progressed, higher prices being quoted daily, even advances in Singapore freights affecting the market to the extent of a gain of at least a cent. Finally came, as a factor in the elevation of prices, the news of the closing of the Suez Canal to rubber shipments in the form of an announcement that two steamships carrying rubber—the "Bolton Castle" and the "Inverclyde"—had been routed via the Cape of Good Hope.

The local December market was characterized as a creation of the dealers, with a few of the smaller rubber mills in evidence, large buyers appearing to be satisfied with making inquiries. During the last week of the year, uncertainty prevailed in Beaver street, a strong market serving to steady the rapidly advancing prices. First latex spot was quoted on December 30 at \$1. Upriver fine was strong at 88 cents.

LONDON.

The market has displayed a firm and steady tone throughout the month. Such changes as have occurred, and they have mainly been in an upward direction, have been due to extraneous causes, such as advances in freight rates, uncertainty of arrivals, difficulty in handling consignments on arrival, etc.

The demand is on a broader scale and a fair business has been transacted, with prices steady, the demand from home manufacturers being the main support of the market. Although shipments from producing centers show no falling off, for the reasons above stated, arrivals have been falling below the requirements for delivery which has promoted buying on the part of consumers of early stocks. The reported activity of enemy submarines in the Mediterranean has had the same effect.

The demand from the United States has been good and it is noted that in many cases buyers were at one time willing to enter into forward contracts at a slight advance on present figures, but prices eased off a little and there was less inclination to make advance arrangements.

SINGAPORE.

News from this important rubber market is scant and conditions are best indicated by the course of events at the weekly auctions. Our last report describes fine pale crepe in exceptional demand and selling up to 57 cents. Highest price was 54, paid for fine ribbed smoked. Unsmoked sheet was also in demand, ribbed and plain, at 54 and 54½, a slight increase on previous quotations. The lower grades moved off freely and although bidding at the outset was slow, nearly all the offerings were disposed of.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and December 30, the current date:

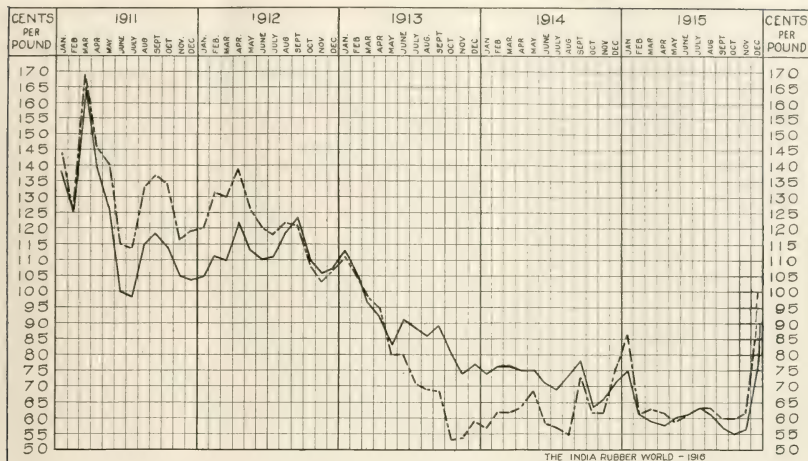
PARA.	Jan. 1, '15.	Dec. 1, '15.	Dec. 30, '15.
Upriver, fine, new.....	.. @75	68 @	87 @ 88
Upriver, fine, old.....	.. @75	69 @	87 @ 88
Islands, fine, new.....	67 @ 70	65 @	80 @ 81
Islands, fine, old.....	.. @60	58 @	72 @ 73
Upriver, coarse, old.....	.. @40	33 @	45 @ 46
Islands, coarse, new.....	37 @ 38	33 @	45 @ 46
Islands, coarse, old.....	.. @40	35 @	49 @ 50
Cameta.....	.. @61	58 @	75 @
Cauchó, ball, upper.....	.. @58	56 @	73 @
Cauchó, ball, lower.....	.. @58	56 @	73 @
PLANTATION HEVEA.			
Smoked sheet ribbed.....	91 @ 93	75 @	99 @ 1.00
First latex crepe.....	86 @ 87	75 @	99 @ 1.00
Fine sheets and biscuits, unsmoked.....			Practically Unobtainable
CENTRALS.			
Cortino.....	58 @ 60	52 @ 53	69 @
Esmeralda, saucer.....	58 @ 60	54 @ 55	68 @
Nicaragua, scrap.....	.. @60	53 @ 55	68 @
Mexican plantation, sheet.....	.. @60	53½ @ 54	75 @
Mexican, scrap.....	.. @60	53½ @ 54	67 @ 68
Mexican, slab.....	.. @60	53 @ 55	68 @
Manicoba.....	.. @60	55 @	57
Mangabeira, sheet.....	.. @60	47 @	50
Soudan Niggers.....	38 @ 39	33 @ 35	48 @
Guayule.....	52 @ 53	56 @ 58	57 @
Balata, sheet.....	41 @ 42	45 @ 46	45 @
Balata, block.....	.. @42	45 @ 46	45 @
AFRICAN.			
Lopori, ball, prime.....	70 @ 75	65 @	.....
Upper Congo, ball, red.....	.. @75	63 @	64
Rio Nunez Niggers.....	.. @75	60 @	61
Conakry Niggers.....	.. @75	60 @	61
Massai, red.....	.. @75	60 @	61
Soudan Niggers.....	.. @75	60 @	61
Cameroon, ball.....	.. @55	39 @ 40	50 @ 51
Jenguela No. 2.....	36 @ 38	35 @ 37	48 @ 50
Acra, flake.....	.. @35	35 @ 37	48 @ 50
EAST INDIAN.			
Assam.....	.. @75	50 @ 54	71 @ 72
Pontipak.....	71½ @ 72	64½ @ 7	11¼ @ 12
Gutta Sial.....	.. @75	11¼ @ 12	12 @ 13
Borneo III.....	.. @75	38 @ 40	34 @
Gutta Pechu.....	.. @75	39 @ 40	50 @ 51
Red Macassar.....	.. @75	1.85 @ 2.00	1.78 @ 1.90

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York), advises as follows: "During December the money market has continued easy, and the demand for commercial paper good, as for several months past, the best rubber names going freely at 4@4½ per cent, and those not so well known at 4½@5½ per cent, according to grade."

NEW YORK PRICES FOR NOVEMBER (NEW RUBBER).

	1913.	1914.	1915.
Upriver, fine.....	\$0.73 @ 0.80	\$0.63 @ 0.71	\$0.57 @ 0.76
Upriver, coarse.....	.. @49	46 @	53
Islands, fine.....	.. @70	50 @	61
Islands, coarse.....	.. @30	28 @	32
Cameta.....	.. @37	29 @	34



Upriver Fine

First Latex Crepe

CHART SHOWING FLUCTUATIONS IN PARA AND PLANTATION RUBBER FOR FIVE YEARS

The prices are spot quotations on the first of each month, and are indicated on imaginary vertical lines bisecting the spaces representing the months.

Plantation Rubber from the Far East.

TOTAL EXPORTS FROM MALAYA.

(From January to date named). Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	Singapore.	Malacca.	Penang.	Port Swettenham.	Total.
Great Britain pounds	23,623,400	6,617,032	17,702,865	23,695,003	71,638,300
Germany	3,881,334		745,599	24,640	4,353,573
Japan	1,705,915		437,866	1,269,159	1,705,915
Ceylon	22,050				22,050
United States	20,062,400		2,451,934		35,314,334
Australia	342,059				342,059
Total	59,539,158	6,617,032	21,338,264	24,988,802	112,483,256
Same period, 1914.	28,968,720	4,108,376	15,948,133	23,840,136	73,865,365
Same period, 1913.	19,172,856		11,334,533	22,244,550	52,751,139
Same period, 1912.	9,998,689		6,737,897	15,811,164	32,547,750

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to November 23, 1914 and 1915. Compiled by the Ceylon Chamber of Commerce.)

To—	1914.	1915.
Great Britain	17,199,139	21,561,403
United States	9,103,791	16,237,767
Belgium	2,984,000	
Germany	1,037,415	
Australia	571,773	
France	320,152	
Japan	243,818	
Russia	105,212	
Switzerland	42,535	
Italy	1,772	
India	1,050	
Canada and Newfoundland		392,495
Total	31,615,656	40,128,128

(Same period 1913, 21,536,349 pounds; same period, 1912, 12,083,717.)
 The spot figures of rubber given in the above table for 1914 include the imports re-exported. (These amount to 3,369,319 pounds.) To arrive at the total quantity of Ceylon rubber exported for that period deduct these imports from the total exports. The figures for 1915 are for Ceylon rubber only.

SINGAPORE.

Arthur & Co., Ltd., report (November 3, 1915):
 There was a falling off in the quantity offered at the auction, some 226 tons being catalogued, 190 tons of which changed hands.

At the outset bidding was slow, but demand improved considerably during the course of the forenoon.

In the afternoon the tone was quieter.
 Time-pale crepe was in exceptional demand and sold up to \$136, an increase of \$2. Fine ribbed smoked sheet fetched the top price of the sale, viz. \$137, all parcels selling readily.

Unsmoked sheet was wanted, ribbed and plain, at \$127 and \$125 showing improvements of \$2 and \$1 respectively.

The lower grades moved off freely at an average increase of \$3.
 There was very little scrap on offer.
 The following was the course of values:

	In Singapore Pical.	Sterling equivalent per pound in London.	Equivalent per pound in cents.
Sheet, fine ribbed smoked....	127 @ 131	2 5/8 @ 2 6/8	60.05 @ 61.83
Sheet, fair to good ribbed smoked....	135 @ 127	2 5/8 @ 2 5/8	59.30 @ 60.05
Sheet, plain smoked....	119 @ 127	2 4 @ 2 5/8	56.76 @ 60.05
Sheet, ribbed unsmoked....	119 @ 125	2 4 @ 2 5/8	56.76 @ 59.29
Sheet, plain unsmoked....	135 @ 136	2 7/8 @ 2 7/8	63.60 @ 63.60
Crepe, fine pale....	133 @ 134	2 6/8 @ 2 7/8	63.58 @ 63.09
Crepe, good pale....	129 @ 131	2 6/8 @ 2 6/8	61.06 @ 61.83
Crepe, fine brown....	125 @ 128	2 4 1/2 @ 2 5/8	58.02 @ 60.56
Crepe, good brown....	110 @ 121	2 3/8 @ 2 4 1/2	52.95 @ 57.52
Crepe, dark....	98 @ 113	1 11/16 @ 2 2 1/4	47.80 @ 54.22
Crepe, bark....	89 @ 94	1 7/16 @ 1 10/16	40.04 @ 46.12
Scrap, house....	68 @ 108	1 5/16 @ 2 1 1/8	34.97 @ 51.95

*Pical—133 1/2 pounds.

Quoted in S. S. dollars = 2 4 [56 cents].

PLANTATION RUBBER EXPORTS FROM JAVA AND MADURA.

EXPORTS TO—	1914.	1915.	September.	Nine Months Ending September 30.
Holland
Great Britain
United States
Germany
France
Belgium
Italy
Japan
Australia
Canada and Newfoundland
Total

Japan.....Hevea.....	2,200	.....	213,400
Other Countries.....Ficus.....	1,426	249	1,969
Hevea.....	15,400	.....	114,400
Total.....	16,826	249	116,369
Grand Total 1906/082.....	1,648,836	6,841,406	12,798,066

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram received from Kuala Lumpur reports that the export of plantation rubber from the Federated Malay States during the month of November amounted to 4,636 tons, as compared with 4,120 tons in October, and 3,869 tons in the corresponding month last year.

The following is a comparative table showing the exports for three years:

	1913.	1914.	1915.
January.....	4,131	3,442	3,473
February.....	1,272	3,364	3,411
March.....	1,257	2,069	2,708
April.....	1,676	2,351	2,777
May.....	1,223	2,069	2,708
June.....	1,008	1,406	2,303
July.....	1,781	2,071	3,687
August.....	2,363	1,850	3,796
September.....	2,000	2,871	4,120
October.....	2,160	2,897	4,120
November.....	2,062	2,889	4,636
Total.....	20,847	27,336	39,413

* In the original statement for September, the total exports were returned at 3,334 tons, at 650 tons below the actual amount, as now corrected.

IMPORTS FROM PARA AT NEW YORK.

(The Figures Indicate Weights in Pounds.)

NOVEMBER 26.—By the steamer *Francis* from Pará, Manáos:

	Fine.	Medium.	Coarse.	Cauchó.	Total.
Meyer & Brown.....	158,200	29,600	74,400	19,400	280,600
Robinson & Co.....	84,700	9,400	31,400	200	125,700
Arnold & Zeiss.....	5,400	400	85,800	33,700	125,300
General Rubber Co.....	.....	.....	38,300	.....	38,300
Adolph Hirsch & Co.....	24,700	3,900	.....	2,700	31,300
Allen's Successors, Ltd.....	19,114	3,088	6,146	1,173	31,433
Hagemeyer & Braun.....	.....	.....	11,200	9,000	20,200
Henderson & Korn.....	.....	.....	3,000	.....	3,000
J. T. Johnstone & Co.....	.....	.....	11,500	9,000	20,500
Total.....	292,114	46,198	265,946	77,175	681,433

NOVEMBER 26.—By the steamer *Gregory* from Iquitos:

	Unrated Bank.	Spain.	America.	H. C. Kupper.	H. A. Astlett & Co.	W. R. Grace & Co.	J. T. Johnstone & Co.	Rumsey & Greutert Co., Inc.	Toledano Exporting Co.
G. Amsinck & Co.....	12,400	400	5,200	125,200	143,200	.....	.....	.....	.....
Arnold & Zeiss.....	.....	.....	2,800	100,900	108,000	.....	.....	.....	.....
H. C. Kupper.....	36,200	.....	17,800	30,500	84,500	.....	.....	.....	.....
H. A. Astlett & Co.....	30,000	3,400	.....	.....	33,400	.....	.....	.....	.....
W. R. Grace & Co.....	12,500	.....	3,400	23,100	39,000	.....	.....	.....	.....
J. T. Johnstone & Co.....	27,500	.....	8,000	.....	35,500	.....	.....	.....	.....
Rumsey & Greutert Co., Inc.....	1,500	.....	600	3,000	6,100	.....	.....	.....	.....
Toledano Exporting Co.....	.....	.....	3,000	1,500	4,500	.....	.....	.....	.....
Total.....	125,400	3,800	49,700	316,200	495,100	.....	.....	.....	.....

NOVEMBER 26.—By the steamer *Gregory* from Pará, Manáos:

	1913.	1914.	1915.
Meyer & Brown.....	71,300	9,000	28,800
Arnold & Zeiss.....	245,500	10,300	32,900
Robinson & Co.....	144,800	300	45,800
H. A. Astlett & Co.....	47,300	28,900	105,800
Henderson & Korn.....	37,000	8,000	7,900
General Rubber Co.....	.....	6,000	71,000
Allen's Successors, Ltd.....	4,133	16,126	39,705
G. Amsinck & Co.....	33,800	1,500	13,500
Adolph Hirsch & Co.....	22,200	4,000	6,600
Cowdrey & Co.....	5,100	.....	1,000
Total.....	611,123	78,726	393,605

NOVEMBER 26.—By the steamer *Gregory* from Pará, Manáos:

	1913.	1914.	1915.
Meyer & Brown.....	71,300	9,000	28,800
Arnold & Zeiss.....	245,500	10,300	32,900
Robinson & Co.....	144,800	300	45,800
H. A. Astlett & Co.....	47,300	28,900	105,800
Henderson & Korn.....	37,000	8,000	7,900
General Rubber Co.....	.....	6,000	71,000
Allen's Successors, Ltd.....	4,133	16,126	39,705
G. Amsinck & Co.....	33,800	1,500	13,500
Adolph Hirsch & Co.....	22,200	4,000	6,600
Cowdrey & Co.....	5,100	.....	1,000
Total.....	611,123	78,726	393,605

PARA RUBBER VIA EUROPE.

	POUNDS.
NOVEMBER 26.—By the <i>Panama</i> —Colon:	7,500
W. R. Grace & Co. (Fine).....	.....
NOVEMBER 29.—By the <i>Ancon</i> —Colon:	28,000
G. Amsinck & Co. (Cauchó).....	.....
DECEMBER 1.—By the <i>Allianca</i> —Colon:	12,500
G. Amsinck & Co. (Fine).....	.....
G. Amsinck & Co. (Coarse).....	.....
W. R. Grace & Co. (Fine).....	37,500
W. R. Grace & Co. (Coarse).....	2,000
Total.....	53,200

AFRICANS.

	POUNDS.
NOVEMBER 23.—By the <i>Etiopia</i> —Liverpool:	56,000
Arnold & Zeiss.....	.....
Earle Bros.....	8,000
NOVEMBER 23.—By the <i>Hindoo</i> —Colon:	64,000
Arnold & Zeiss.....	35,000
Robert Badenhop.....	7,500
NOVEMBER 3.—By the <i>RE</i> —Liverpool:	15,700
Henderson & Korn.....	11,200
Various.....	4,500
NOVEMBER 20.—By the <i>Delphin</i> —Liverpool:	19,400
Rubber Trading Co.....	.....
NOVEMBER 30.—By the <i>Philadelph</i> —London:	4,500
Henderson & Korn.....	.....
DECEMBER 1.—By the <i>Roma</i> —Lisbon:	80,000
Edward Maurer Co., Inc.....	3,500
S. R. Sequerra.....	83,500

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official cablegram received from Singapore announces that the export of plantation rubber from the Straits Settlements during the month of November amounted to 4,292 tons as compared with 2,641 tons in October and 2,370 tons in the corresponding month last year. The total for eleven months of the present year is 31,886 tons compared with 17,393 tons in 1915 and 10,672 tons for the corresponding period in 1913. The following is a comparative table showing the exports for three years:

	1913.	1914.	1915.
January.....	784	1,181	2,576
February.....	743	1,703	2,741
March.....	806	1,285	4,472
April.....	762	1,548	1,978
May.....	814	1,409	3,588
June.....	812	1,249	2,249
July.....	1,130	1,584	2,324
August.....	1,415	1,325	2,295
September.....	1,057	39,100	47,25
October.....	1,144	2,006	2,641
November.....	1,223	2,370	4,292
Total.....	10,672	17,393	31,886

These figures include trans-shipments of rubber from various places in the neighborhood of the Straits Settlements, such as Batavia, Java, Sumatra and the non-Federated Malay States, as well as rubber actually exported from the colony, but do not include similar exports from the Federated Malay States.

NOVEMBER 29.—By the steamer *Sao Paulo* from Pará, Manáos:

	1913.	1914.	1915.
Meyer & Brown.....	45,900	5,500	6,000
Arnold & Zeiss.....	137,100	31,200	16,000
Allen's Successors, Ltd.....	98,500	24,284	41,607
G. Amsinck & Co.....	41,900	1,057	39,100
H. A. Astlett & Co.....	12,200	3,200	40,200
Robinson & Co.....	20,800	3,200	17,000
Muller, Schall & Co.....	15,400	.....	1,700
Rumsey & Greutert Co., Inc.....	83,300	800	500
Total.....	400,400	46,684	162,407

DECEMBER 10.—By the steamer *Stephen* from Pará, Manáos:

	1913.	1914.	1915.
Meyer & Brown.....	83,500	6,700	62,300
Arnold & Zeiss.....	154,600	14,600	90,700
Robinson & Co.....	183,200	10,200	22,700
H. A. Astlett & Co.....	72,700	17,000	1,700
General Rubber Co.....	131,000	22,000	28,700
Allen's Successors, Ltd.....	58,866	16,300	41,550
G. Amsinck & Co.....	61,400	6,000	20,500
Henderson & Korn.....	30,600	8,000	12,200
Adolph Hirsch & Co.....	26,000	2,700	2,200
J. T. Johnstone & Co.....	.....	.....	35,000
W. R. Grace & Co.....	12,900	7,300	.....
Total.....	819,368	114,600	360,350

DECEMBER 14.—By the steamer *Acre* from Pará:

	1913.	1914.	1915.
Meyer & Brown.....	110,400	1,400	26,600
G. Amsinck & Co.....	176,800	10,000	31,000
Paul Beruch.....	218,400	.....	33,200
Arnold & Zeiss.....	47,200	3,000	51,200
H. A. Astlett & Co.....	1,100	3,900	35,600
Henderson & Korn.....	400	200	29,100
Allen's Successors, Ltd.....	11,676	8,996	.....
F. D. Dusw & Co.....	6,300	.....	6,000
Total.....	560,600	30,176	182,496

CENTRALS.

	POUNDS.
DECEMBER 20.—By the <i>Lusa</i> —Lisbon:	70,000
Edward Maurer Co., Inc.....	.....
DECEMBER 22.—By the <i>Paris</i> —Lisbon:	56,000
Edward Maurer Co., Inc.....	.....
W. H. Stiles.....	3,000
S. R. Sequerra.....	3,000

(*This sign, in connection with imports of Centrals, denotes Guayule rubber.)

	POUNDS.
NOVEMBER 24.—By the <i>Metapora</i> —Port Linnon:	700
Isaac Brandon & Bros.....	300
Fruit Despatch Co.....	1,000
NOVEMBER 26.—By the <i>Panama</i> —Colon:	8,100
G. Amsinck & Co.....	.....
A. M. Capen's Sons.....	500
Lawrence Johnson & Co.....	4,900
Muller, Schall & Co.....	3,000
Henderson & Korn.....	1,200
W. R. Grace & Co.....	2,300
J. S. Sembrada & Co.....	2,200
Herman Wolf & Co.....	800
Potterberg, Ebeling & Co.....	3,300
Mecke & Co.....	4,000
Lanman & Kemp.....	3,400
Gontard & Co.....	3,400
G. R. Barthold.....	100
Meister Hecht.....	100
American Trading Co.....	2,000
Andean Trading Co.....	7,300
NOVEMBER 27.—By the <i>Montevideo</i> —Mexico:	47,200
Lawrence Johnson & Co.....	1,500
H. Marquardt & Co.....	10,000

POUNDS.		MANIHOT AND CAUCHO.		POUNDS.	
J. A. Medina & Co.	1,000	NOVEMBER 22.—By the <i>Hubert</i> =Parnahyba:		Alden's Successors, Ltd.	489,833
General Export & Commission	400	J. H. Rosshach & Bros. (Mani- coba)	32,000	W. R. Grace & Co.	22,500
Various	3,500	J. H. Rosshach & Bros. (Mani- coba)	1,000	General Rubber Co.	335,000
NOVEMBER 29.—By the <i>Lucas</i> =Parna- Cortez:		J. H. Rosshach & Bros. (Mani- coba)	1,000	J. T. Johnstone & Co.	14,000
J. S. Sembrada & Co.	3,000	Various (Ceara)	76,000	Robert Badenhop	90,000
Goldsmith & Co.	1,000	Thomson & Co. (Mangabeira)	5,000	Charles T. Wilson Co., Inc.	67,000
W. R. Grace & Co.	500	Various (Ceara)	81,000	L. Littlejohn & Co.	15,076
W. Cairo Co., Inc.	100	DECEMBER 10.—By the <i>Stephen</i> =Ceara:		Edward Maurer Co., Inc.	95,000
NOVEMBER 29.—By the <i>St. Peter</i> =Bahia:		Various (Ceara)	219,000	DECEMBER 3.—By the <i>Keeling</i> =Colombo:	1,478,809
Lawrence Johnson & Co.	5,000	DECEMBER 10.—By the <i>Stephen</i> =Pernambuco:		Meyer & Brown	180,500
NOVEMBER 29.—By the <i>Porter</i> =New Orleans:		Lawrence Johnson & Co. (Manicoba)	9,000	General Rubber Co.	60,000
E. Steiger & Co.	10,000	PLANTATION RUBBER		L. Littlejohn & Co.	114,000
General Export & Commission	600	NOVEMBER 3.—By the <i>Indragiri</i> =Singapore:		Arnold & Zeiss	20,000
Pottberg, Ebeling & Co.	5,000	L. Littlejohn & Co.	450,000	Henderson & Korn	130,000
G. Amsinck & Co.	2,500	General Rubber Co.	360,000	Robinson & Co.	30,000
DECEMBER 6.—By the <i>Mercurio</i> =Mexico:		Henderson & Korn	115,000	Aladen's Successors, Ltd.	21,280
Co.	4,000	J. T. Johnstone & Co.	115,000	Various	92,520
H. Marquardt & Co.	2,500	Arnold & Zeiss	135,000	DECEMBER 3.—By the <i>Adriatic</i> =Liverpool:	22,500
Various	6,000	General Rubber Co.	4,500	General Rubber Co.	
NOVEMBER 6.—By the <i>Byland</i> =Laguna:		Edward Maurer Co., Inc.	80,000	DECEMBER 6.—By the <i>Mississippi</i> =London:	
H. Marquardt & Co.	2,000	Charles T. Wilson Co., Inc.	75,000	Goodyear Tire & Rubber Co.	260,000
DECEMBER 7.—By the <i>Calanques</i> =Port Limon:		Charles T. Wilson Co., Inc.	75,000	General Rubber Co.	130,000
Isaac Brandon & Bros.	1,500	Goodyear Tire & Rubber Co.	45,000	Edward Maurer Co., Inc.	96,000
DECEMBER 8.—By the <i>Cristobal</i> =Colon:		Alden's Successors, Ltd.	56,027	DECEMBER 6.—By the <i>Indragiri</i> =Singapore:	
G. Amsinck & Co.	31,100	Robinson & Co.	22,500	L. Littlejohn & Co.	389,300
Muller, Schall & Co.	1,200	Malaysian Rubber Co.	4,500	Henderson & Korn	290,000
J. S. Sembrada & Co.	29,000	Rubber Trading Co.	4,000	Arnold & Zeiss	145,000
J. S. Sembrada & Co.	6,000	H. R. Jeffords	3,500	General Rubber Co.	140,000
Pablo, Calvet & Co.	1,000	Various	1,920,500	J. T. Johnstone & Co.	82,000
Pottberg, Ebeling & Co.	5,200	NOVEMBER 24.—By the <i>Langkat</i> =London:		Goodyear Tire & Rubber Co.	60,000
Andean Trading Co.	2,000	Meyer & Brown	22,500	Firestone Tire & Rubber Co.	60,000
W. R. Grace & Co.	4,200	Edward Maurer Co., Inc.	40,000	Charles T. Wilson Co., Inc.	90,000
Silva Bussentin & Co.	1,400	Robert Badenhop	4,500	Robert Badenhop	75,000
Various	93,400	Goodyear Tire & Rubber Co.	235,000	Alden's Successors, Ltd.	28,000
DECEMBER 9.—By the <i>Colon</i> =Colon:		General Rubber Co.	105,000	Robert Badenhop	22,500
G. Amsinck & Co.	6,700	L. Littlejohn & Co.	11,200	W. R. Grace & Co.	7,000
Herman Wolff & Co.	6,000	NOVEMBER 26.—By the <i>Finland</i> =London:		Edward Maurer Co., Inc.	4,000
Pablo, Calvet & Co.	3,500	Goodyear Tire & Rubber Co.	80,000	Alden's Successors, Ltd.	60,484
Pottberg, Ebeling & Co.	2,000	Edward Maurer Co., Inc.	11,200	DECEMBER 10.—By the <i>Neu-Mohlen</i> = Rottterdam:	1,528,793
A. M. Capen's Sons	3,500	Meyer & Brown	22,500	Meyer & Brown	100,000
C. E. Griffin	2,000	L. Littlejohn & Co.	58,408	Edward Maurer Co., Inc.	125,000
J. S. Sembrada & Co.	2,000	Goodyear Tire & Rubber Co.	6,000	Goodyear Tire & Rubber Co.	175,000
Piza, Nepheus & Co.	4,500	Henderson & Korn	33,500	Rubber Trading Co.	18,000
Pedague Bros.	35,100	Adolph Hirsch & Co.	22,500	Charles T. Wilson Co., Inc.	22,500
Various	700	Robinson & Co.	11,200	L. Littlejohn & Co.	23,450
DECEMBER 10.—By the <i>Carillo</i> =Cartagena:		Arnold & Zeiss	11,200	DECEMBER 10.—By the <i>New Amsterdam</i> =Rot- terdam:	463,950
G. Amsinck & Co.	1,500	W. R. Grace & Co.	11,200	Alden's Successors, Ltd.	23,152
A. Held	1,000	J. T. Johnstone & Co.	34,000	Various	10,348
DECEMBER 11.—By the <i>El Sol</i> =Galveston:		Various	53,792	DECEMBER 17.—By the <i>Minneapolis</i> =London:	33,500
Various	17,000	NOVEMBER 26.—By the <i>London</i> =Colombo:		Goodyear Tire & Rubber Co.	90,000
DECEMBER 13.—By the <i>Nuevo</i> =Mexico:		Meyer & Brown	56,000	General Rubber Co.	90,000
American Trading Co.	20,000	L. Littlejohn & Co.	115,600	Edward Maurer Co., Inc.	30,000
J. S. Sembrada & Co.	600	Adolph Hirsch & Co.	11,200	Rubber Trading Co.	5,000
J. A. Medina & Co.	200	Goodyear Tire & Rubber Co.	8,000	DECEMBER 15.—By the <i>St. Antonio</i> =Colombo:	325,000
Pablo, Calvet & Co.	200	Arnold & Zeiss	67,000	Meyer & Brown	180,000
H. Marquardt & Co.	200	Henderson & Korn	25,000	Charles T. Wilson Co., Inc.	24,500
DECEMBER 13.—By the <i>Tennyson</i> =Bahia:		Various	104,400	J. T. Johnstone & Co.	50,500
Adolph Hirsch & Co.	50,000	NOVEMBER 26.—By the <i>Finland</i> =London:		Michael Tite & Co.	3,500
DECEMBER 13.—By the <i>Nuevo</i> =Mexico:		Meyer & Brown	56,000	Rumsey & Greutert Co., Inc.	67,000
West Coast Rubber Co.	1,000	L. Littlejohn & Co.	115,600	Robinson & Co.	13,500
J. S. Sembrada & Co.	1,500	Adolph Hirsch & Co.	11,200	Edward Maurer Co., Inc.	70,000
Ergers & Heinen Co.	3,500	Goodyear Tire & Rubber Co.	8,000	General Rubber Co.	425,000
DECEMBER 14.—By the <i>Tendone</i> =Port Limon:		Arnold & Zeiss	67,000	Charles T. Wilson Co., Inc.	90,000
Isaac Brandon & Bros.	2,000	Henderson & Korn	25,000	L. Littlejohn & Co.	10,000
DECEMBER 15.—By the <i>Francisco</i> =Galveston:		Various	104,400	DECEMBER 23.—By the <i>Tropea</i> =London:	
Various	35,000	NOVEMBER 26.—By the <i>Finland</i> =London:		Meyer & Brown	24,000
DECEMBER 17.—By the <i>Santa Maria</i> =Colombia:		Meyer & Brown	56,000	General Rubber Co.	90,000
G. Amsinck & Co.	1,500	L. Littlejohn & Co.	115,600	Rumsey & Greutert Co., Inc.	2,200
International Trading Co.	1,500	Adolph Hirsch & Co.	11,200	Henderson & Korn	37,000
Pottberg, Ebeling & Co.	1,000	Goodyear Tire & Rubber Co.	8,000	L. Littlejohn & Co.	38,000
Pablo, Calvet & Co.	1,000	Arnold & Zeiss	67,000	Michael Tite & Co.	33,000
Andean Trading Co.	1,500	Henderson & Korn	25,000	Robinson & Co.	23,000
DECEMBER 17.—By the <i>Advance</i> =Colon:		Various	104,400	Arnold & Zeiss	70,000
Gravenhorst & Co.	1,000	NOVEMBER 26.—By the <i>Finland</i> =London:		Edward Maurer Co., Inc.	135,000
DECEMBER 17.—By the <i>San Antonio</i> =Mexico:		Meyer & Brown	56,000	Charles T. Wilson Co., Inc.	2,200
Henderson & Korn	6,000	L. Littlejohn & Co.	115,600	Rubber Trading Co.	10,000
J. A. Medina & Co.	1,000	Adolph Hirsch & Co.	11,200	DECEMBER 23.—By the <i>Tropea</i> =London:	
General Export & Commission	500	Goodyear Tire & Rubber Co.	8,000	Meyer & Brown	24,000
Co.	500	Arnold & Zeiss	67,000	General Rubber Co.	90,000
J. S. Sembrada & Co.	6,000	Henderson & Korn	25,000	Rumsey & Greutert Co., Inc.	2,200
Lawrence Johnson & Co.	500	Various	104,400	Aladen's Successors, Ltd.	500,000
Various	10,000	NOVEMBER 26.—By the <i>Finland</i> =London:		Hewitt Rubber Co.	2,200
DECEMBER 23.—By the <i>Finland</i> =Galveston:		Meyer & Brown	56,000	Henderson & Korn	37,000
Various	45,000	L. Littlejohn & Co.	115,600	L. Littlejohn & Co.	38,000
DECEMBER 23.—By the <i>Panama</i> =Colon:		Adolph Hirsch & Co.	11,200	Michael Tite & Co.	33,000
G. Amsinck & Co.	18,800	Goodyear Tire & Rubber Co.	8,000	Robinson & Co.	23,000
Charles T. Wilson Co., Inc.	2,200	Arnold & Zeiss	67,000	Arnold & Zeiss	70,000
R. G. Barthold	1,000	Henderson & Korn	25,000	Edward Maurer Co., Inc.	135,000
C. E. Griffin	8,000	Various	104,400	Charles T. Wilson Co., Inc.	2,200
Rubber Trading Co.	2,000	NOVEMBER 26.—By the <i>Saron</i> =March=:London:		DECEMBER 23.—By the <i>Mineira</i> =Colombo:	
Isaac Brandon Bros.	400	Meyer & Brown	70,000	Meyer & Brown	230,000
Dumarest Bros.	600	Rumsey & Greutert Co., Inc.	45,000	L. Littlejohn & Co.	130,000
		Rubber Trading Co.	37,400	Arnold & Zeiss	30,000

Henderson & Korn.....	87,000	
Edward Maurer Co., Inc.....	65,000	
W. R. Grace & Co.....	11,000	
J. T. Johnston & Co.....	6,000	
W. H. Stiles.....	2,300	
Various.....	15,000	626,400

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK—OCTOBER, 1915.		
Imports:	Pounds.	Value.
India rubber.....	16,048,741	\$8,098,601
Balata.....	986,539	79,148
Gutta percha.....	53,919	9,415
Gutta jelutong (Pontianak).....	1,142,542	55,008
Total.....	17,421,738	\$8,242,162

Exports:	Pounds.	Value.
India rubber.....	45,834	\$25,570
Balata.....	13,768	4,922
Rubber scrap.....	172,561	2,626
Total.....	232,163	\$53,118

PORT OF SAN FRANCISCO—OCTOBER, 1915.		
Imports:	Pounds.	Value.
India rubber.....	654,810	\$341,710
Gutta jelutong (Pontianak).....	56,259	1,904
Rubber scrap.....	4,930	187
Total.....	715,999	\$343,801

PORT OF BOSTON—NOVEMBER, 1915.		
Imports:	Pounds.	Value.
Gutta jelutong (Straits Settlements).....	226,718	\$4,693

Pounds. Value.		
Gutta percha (Straits Settlements).....	3,600	306
India rubber.....	86,866	36,638
Straits Settlements.....	22,400	12,944
British East Indies.....	75,441	33,329
English.....	—	—
Manufactures of India rubber.....	—	3,936

Total.....	415,025	\$91,846
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Exports:		
India rubber, scrap.....	6,865	\$328
India rubber, belting, etc.....	22,156	1,216
India rubber boots.....	33,871	74,462
India rubber shoes.....	123,840	49,821
Automobile tires.....	—	2,163
All other manufactures of india rubber.....	—	57,565

PORT OF CHICAGO—NOVEMBER, 1915.		
Imports:	Pounds.	Value.
India rubber scrap or refuse fit only for remanufacture (Canada).....	42,778	\$3,036

PORT OF CLEVELAND—NOVEMBER, 1915.		
Imports:	Pounds.	Value.
India rubber.....	746,768	\$361,708
Rubber scrap.....	51,484	141
Manufactures of india rubber.....	—	\$2,853
Total.....	797,852	\$364,702

Exports:		
Manufactures of india rubber.....	—	\$68

PORT OF DETROIT—NOVEMBER, 1915.		
Imports:	Pounds.	Value.
Rubber scrap.....	684	\$41
Rubber scrap.....	35,790	\$2,455
Rubber reclaimed.....	—	221
Total.....	38,367	\$2,676

PORT OF NEW ORLEANS—NOVEMBER, 1915.		
Imports:	Pounds.	Value.
India rubber.....	77,448	\$31,505

PORT OF NIAGARA FALLS—NOVEMBER, 1915.		
Imports:	Pounds.	Value.
India rubber.....	200,731	\$103,349
Rubber scrap.....	66,658	7,787
Reclaimed rubber.....	—	—
Total.....	287,933	\$111,836

PORT OF PHILADELPHIA—NOVEMBER, 1915.		
Imports:	Pounds.	Value.
Rubber scrap.....	10,043	\$1,625

PORT OF PORT HURON—NOVEMBER, 1915.		
Imports:	Pounds.	Value.
Manufactures of india rubber.....	—	\$1,206

Exports:		
Rubber scrap.....	35,790	\$2,455
Manufactures of india rubber.....	—	1,690
Total.....	35,790	\$4,145

PORT OF SAN FRANCISCO—NOVEMBER, 1915.		
Imports:	Pounds.	Value.
India rubber.....	310,838	\$122,376

IMPORTS AND EXPORTS OF RUBBER AND RUBBER MANUFACTURES AT THE PORT OF NEW YORK.

IMPORTS.*

	India Rubber.		Rubber Waste.		Rubber Manufactures.		Chicle.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Week ending November 30.....	38,102	\$3,252,201	435	\$2,271	74	\$10,211	485	\$28,000
List issued November 11.....	3,623,122	1,917,281	93,173	5,163	—	—	—	—
List issued December 17.....	2,305,082	1,594,592	27,613	1,550	—	—	—	—
List issued December 24.....	7,085,561	3,430,237	45,773	3,126	—	—	40,000	12,448

In addition 17 packages of rubber substitutes were imported during the week ending November 30, value \$820; 198,955 pounds of gutta jelutong, value \$7,707; in issue of December 11; 13,851 pounds of balata, value \$4,267, in issue of December 17; rubber substitutes, value \$799; 20,547 pounds of rubber substitutes, value \$6,143; 1,431,685 pounds of gutta jelutong, value \$58,858; 153,963 pounds of gutta percha, value \$15,182.

EXPORTS.

October 16 to November 1, 1915, and all figures issued from November 23 to December 15, 1915.

MANUFACTURES TO	Belting.		Footwear.		Tires.		Others, of.		Fountain Pens.		Chewing Gum.		Reclaimed Rubber.		Scrap.	
	Boots.	Shoes.	Auto.	Other tires and mfrs. of.	Insulated Wire and Cable.	India Rubber.	India Rubber.	India Rubber.	India Rubber.	India Rubber.	India Rubber.	India Rubber.	India Rubber.	India Rubber.	India Rubber.	India Rubber.
Africa.....	880,038	2,790	\$4,005	\$44,815	\$796	\$2,967	\$5,534	12	358	—	—	—	—	—	—	—
Argentina.....	7,002	—	51	21,546	9,077	8,587	16,670	3285	11,258	—	—	—	—	—	—	—
Australia.....	3,214	—	\$1,888	\$4,157	—	15,801	179	2,821	—	—	—	—	—	—	—	—
Bolivia.....	1,187	—	—	2,013	—	1,105	—	—	—	—	—	—	—	—	—	—
Brazil.....	5,041	—	1,776	32,883	10,067	54,722	33,178	409	776	—	—	—	—	—	—	—
British East Indies.....	—	—	—	11,304	—	241	—	—	—	—	—	—	—	—	—	—
British Guiana.....	—	—	—	—	—	112	—	—	—	—	—	—	—	—	—	—
Canada.....	250	746	17,314	2,334	148	2,487	1,309	12	358	—	—	—	—	—	—	—
Central America and Panama.....	12,571	1,430	518	11,866	8,764	27,039	7,311	330	3,505	—	—	—	—	—	—	—
Chile.....	5,999	445	656	2,847	1,147	20,109	4,069	9	183	—	—	—	—	—	—	—
China.....	1,519	—	—	979	—	232	417	9	—	—	—	—	—	—	—	—
Colombia.....	1,410	—	489	2,545	441	1,722	1,205	—	158	—	—	—	—	—	—	—
Dutch East Indies.....	833	—	—	11,939	596	67,634	320	85	—	—	—	—	—	—	—	—
Dutch Guiana.....	460	—	—	703	744	768	983	21	—	—	—	—	—	—	—	—
Ecuador.....	1,684	—	26	878	388	—	1,758	—	156	—	—	—	—	—	—	—
France.....	521	108,000	28,266	2,04	—	81,248	272	1,313	—	—	—	—	—	—	—	—
Great Britain.....	70,918	195,800	46,934	1,248,765	348,581	43,961	207,810	1,943	32,858	28,899	43,679	—	—	—	—	—
Greece.....	—	—	—	—	—	171	—	—	—	—	—	—	—	—	—	—
Holland.....	—	—	—	2,167	—	690	4,231	2,400	—	—	—	—	—	—	—	—
India.....	—	—	—	7,666	—	3,917	21,358	3,890	—	—	—	—	—	—	—	—
Italy.....	5,221	—	8,846	43,256	24,507	7,724	27,952	160	—	—	—	—	—	—	—	—
Japan.....	—	—	1,123	—	—	1,627	1,263	—	1,287	—	—	—	—	—	—	—
Korea.....	—	—	—	—	—	562	—	—	—	—	—	—	—	—	—	—
New Zealand.....	11,139	—	—	16,758	5,860	10,251	10,451	—	49	124	—	—	—	—	—	—
Norway, Sweden and Denmark.....	174	484	—	23,438	20,784	91	10,346	200	2,040	—	—	—	—	—	—	—
Oceania.....	1,148	—	—	3,498	—	1,306	28,990	8,277	240	—	—	—	—	—	—	—
Peru.....	—	—	—	—	—	409	—	—	—	—	—	—	—	—	—	—
Philippines.....	2,546	—	—	1,943	—	8,971	1,635	—	44	—	—	—	—	—	—	—
Portugal.....	650	—	143	12,356	—	5,274	10,106	—	34	—	—	—	—	—	—	—
Romania.....	—	—	—	1,864	—	451	143	—	—	—	—	—	—	—	—	—
Russia.....	—	—	—	576	—	4,510	—	—	—	—	—	—	—	—	—	—
Saudi Arabia.....	807	—	—	25,839	—	780	—	—	—	—	—	—	—	—	—	—
Spain.....	—	—	—	—	—	379	—	—	—	—	—	—	—	—	—	—
Straits Settlements.....	379	—	—	2,561	—	1,344	4,774	—	—	—	—	—	—	—	—	—
Switzerland.....	—	—	—	618	4,372	—	630	—	422	—	—	—	—	—	—	—
Uruguay.....	637	—	47	11,637	5,684	4,738	3,507	—	—	—	—	—	—	—	—	—
Venezuela.....	29,176	—	—	38,256	1,687	3,780	2,655	—	—	—	—	—	—	—	—	—
West Indies.....	17,923	—	33	1,625	69,306	24,676	21,016	44,164	446	163	119	8,444	—	—	—	—
Totals.....	\$862,239	\$801,016	\$109,037	\$700,892	\$388,840	\$377,038	\$511,287	\$4,724	\$61,151	\$30,823	\$48,377	—	—	—	—	—

In addition to the above the following were exported during the same period: To Great Britain, acropalms, value \$200,216; balata, value \$1,865; chicle, value \$1,047; and india rubber, value \$24,797. Acropalms valued at \$5,000 were exported to Argentina, and india rubber valued at \$30 was exported to Mexico.

*Heretofore these import figures were issued weekly, showing the imports for the preceding week. Since the end of November, 1915, however, the statistics, also issued weekly, include all import figures available on the date of issue not specifying the period covered by those figures.

The first set of figures issued under this system appeared on Saturday, December 11, 1915. The export figures were formerly issued as to specify the clearances each day. Since November 23, 1915, all figures issued are only those available on the day of issue regardless of the day or days of clearance. Evidently the figures issued on November 23 include all those available from November 1 to November 23, 1915.

UNITED STATES IMPORTS OF RUBBER AND RUBBER MANUFACTURES FOR YEAR ENDING JUNE 30, 1915.

	July 1, 1914, to June 30, 1915.	
	Pounds.	Value.
India rubber, gutta percha, etc.		
Unmanufactured—free.		
Balata, crude.	2,473,228	\$963,384
Gutta percha, crude.	5,116,463	1,442,464
Gutta jellifung.	14,766,765	704,613
Gutta percha, crude.	1,776,851	258,132
Crude india rubber.	171,429,176	\$2,812,928
Strain rubber.	10,584,494	\$2,578
Reclaimed rubber.	918,628	112,220
Total.	207,065,307	\$87,121,519
Manufactured—dutiable.		
Gutta percha.		
India rubber.		
Druggists' sundries of rubber.		
Hard rubber.		
Rubber sponges.		
Substitutes, elastic, etc.		
Total.		\$831,937
Chicle: Crude.	2,465,400	\$639,312
Refined.	1,934,760	\$96,889
Total.	4,400,160	\$1,802,201
Insulated wire, cable, etc.		\$43,362

RUBBER STATISTICS FOR CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED, FREE—	September, 1915.		Six months ending September, 1915.	
	Pounds.	Value.	Pounds.	Value.
Rubber and gutta percha, crude				
From Great Britain.	1,122,746	\$325,256	2,473,630	\$1,283,562
United States.	452,668	233,640	1,988,100	993,282
British Straits Settlements.	11,374	6,313	22,574	11,659
Other countries.			169,898	79,492
Total.	1,586,788	\$765,209	4,654,202	\$2,367,995
Rubber, recovered:				
From Great Britain.			4,392	\$2,482
United States.	483,094	\$61,559	2,398,302	301,593
Total.	483,094	\$61,559	2,402,694	\$304,077
Hard rubber, in sheets and rods:				
From United States.	1,364	\$701	36,449	\$4,439
Rubber substitute:				
From Great Britain.			10,820	1,166
United States.	39,608	3,171	231,133	17,136
Total.	39,608	\$3,171	241,953	\$18,302
Rubber, powdered, and rubber or gutta percha waste:				
From Great Britain.			2,709	\$217
United States.	161,233	\$10,523	509,249	\$41,430
Other countries.	150	8	2,609	113
Total.	161,413	\$10,523	574,767	\$41,760
Rubber thread, recovered:				
From United States.	2,496	\$3,406	12,980	\$17,918
Balata, crude:				
From United States.	311	\$171	1,644	\$991
Chicle, crude:				
From Great Britain.			2,888	\$1,675
United States.	13,989	\$4,205	173,691	67,452
British Honduras.	107,664	\$40,592	616,964	225,015
Mexico.			116,294	46,338
Total.	121,653	\$44,797	919,837	\$340,380
MANUFACTURED, DUTABLE.	September, 1915.		Six months ending September, 1915.	
	General Tariff Value.	Preferential Tariff Value.	General Tariff Value.	Preferential Tariff Value.
Waterproof clothing:				
From Great Britain.	\$857	\$20,713	\$2,835	\$231,829
United States.	7,018		65,640	
Other countries.			21	
Total.	\$7,375	\$20,713	\$68,496	\$231,829
Hose, lined with rubber:				
From Great Britain.				\$389
United States.	\$4,872		\$37,395	
Mats and matting:				
From Great Britain.				\$84
United States.	\$143		\$284	
Packings:				
From Great Britain.	\$30	\$155	\$110	\$962
United States.	4,242		26,657	
Total.	\$4,272	\$155	\$26,767	\$962

MANUFACTURED, DUTABLE.	September, 1915.		Six months ending September, 1915.	
	General Tariff Value.	Preferential Tariff Value.	General Tariff Value.	Preferential Tariff Value.
Tires of rubber for all vehicles:				
From Great Britain.	\$1,129	\$2,261	\$9,971	\$26,429
United States.	156,080		668,668	
France.			1,125	
Other countries.	156		1,130	
Total.	\$158,472	\$2,221	\$693,354	\$26,429
*Rubber cement and all manufac- tures of india rubber and gutta percha, N. O. P.:				
From Great Britain.	2,290	\$9,117	\$1,601	\$93,587
United States.	46,847		276,385	
Other countries.	7		334	
Total.	\$47,153	\$9,117	\$280,331	\$93,587
Hard rubber, unfinished, in tubes, for manufacture of fountain pens.				
From United States.				\$1,941
Wehlung, elastic, over one inch wide.				
From Great Britain.	\$10	\$1,078	\$10	\$6,082
United States.	13,131		66,829	
Other countries.			330	
Total.	\$13,141	\$1,078	\$67,169	\$6,082
Boots and shoes:				
From Great Britain.		\$1,146		\$11,546
United States.	\$11,331		\$37,281	
Other countries.				
Total.	\$11,331	\$1,146	\$37,291	\$11,546
Belting:				
From Great Britain.				\$1,041
United States.	\$2,534		\$26,346	

*In addition, the imports of rubber cement and all manufactures of india rubber and gutta percha amounted to \$540 from various countries during September, and \$196 from Great Britain, and \$1,277 from other countries for the six months ending September, the values being at treaty rates.

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

MANUFACTURED, DUTABLE—	September, 1915.		Six months ending September, 1915.	
	Prod- uce of Canada. Value.	Re-exports of foreign goods. Value.	Prod- uce of Canada. Value.	Re-exports of foreign goods. Value.
Belting:				
To Great Britain.			\$337	\$38
United States.	\$337	\$23	74	
Total.	\$337	\$23	\$411	\$38
Hose:				
To Great Britain.				\$4,139
United States.		\$28	3,122	\$145
Newfoundland.	\$277		2,292	
Other countries.	406		1,655	
Total.	\$683	\$28	\$11,208	\$145
Boots and Shoes:				
To Great Britain.	\$22,758		\$26,486	
United States.	5,511	\$85	3,151	\$887
Newfoundland.	28,956		30,960	
Australia.	3,774		10,036	
Other countries.	1,404		9,631	
Total.	\$58,892	\$85	\$80,643	\$887
Mats and matting:				
To various countries.				\$418
Clothing:				
To Great Britain.		\$10	\$27	\$10
United States.			39	202
Newfoundland.			140	
Other countries.	\$13		29,850	10
Total.	\$13	\$10	\$29,916	\$212
*Rubber waste:				
To United States.	\$21,224	\$170	\$285,952	\$1,794
All other, N. O. P.				
United States.	\$101,899		\$345,791	\$1,954
United States.	3,811	\$6,557	68,097	266,272
Newfoundland.	684	785	3,871	785
Other countries.	7,923		964	
Total.	\$114,247	\$7,342	\$450,581	\$269,021
† Gum chicle:				
To Great Britain.				\$5,000
United States.	\$62,774		236,539	\$91,995
Other countries.			39,076	1,107
Total.	\$62,774		\$370,660	\$93,102

*For the month of September the total amount, by weight, of rubber waste exported to the United States was 453,900 pounds, and for the six months ending September was 4,719,700 pounds.

†For the month of September the total amount, by weight of exported chicle gum was 109,368 pounds to the United States, and for the six months ending September was 869,377 pounds, divided as follows: 10,629 to Great Britain, 79,175 to the United States, and 62,202 to other countries.

UNITED KINGDOM RUBBER STATISTICS FOR
MONTH ENDING NOVEMBER 30, 1915.

Imports	November, 1915.		Eleven Months Ending November 30, 1915.	
	Pounds.	Value.	Pounds.	Value.
Unmanufactured—				
*Crude Rubber				
From Dutch West Indies	997,000	\$561,067	6,065,900	\$3,268,899
French West Africa	54,000	20,481	1,242,900	534,309
Gold Coast	47,700	15,158	587,500	177,754
Other countries in Africa	779,100	340,269	5,711,700	2,363,059
Peru	186,500	118,997	1,646,000	860,030
Italy	2,432,000	1,487,218	26,799,900	14,656,656
British India	391,300	230,170	2,884,500	1,537,967
Straits Settlements, including Labuan	5,313,900	3,152,089	61,656,400	32,993,675
Federated Malay States	2,474,100	1,438,633	26,952,600	14,948,194
Ceylon and dependencies	1,908,300	1,135,320	26,383,700	14,303,789
Other countries	263,800	126,501	3,792,700	1,848,365
Total	14,848,600	\$8,623,903	163,923,800	\$87,453,695

Waste and reclaimed rubber	494,400	\$57,188	3,854,900	\$434,625
Gutta percha	505,800	238,076	6,602,600	2,835,888

Manufactured—				
Apparel, waterproofed	.....	\$1,323	.....	\$24,010
Boots and shoes—dozen pairs	12,107	136,362	132,527	1,054,878
Insulated wire	.....	18,181	.....	420,487
Submarine cables	.....	875	.....	1,512
Automobile tires and tubes	1,748,978	.....	8,624,162	.....
Motorcycle tires and tubes	.....	34,313	.....	507,948
Cycle tires and tubes	.....	34,987	.....	237,702
Tires not specified	.....	12,136	.....	96,379

EXPORTS.

Manufactured—				
Apparel, waterproofed:				
To France	.....	\$5,860	.....	\$172,832
British South Africa	.....	16,786	.....	193,073
British East Indies	.....	3,573	.....	121,170
Australia	.....	17,390	.....	209,656
New Zealand	.....	11,557	.....	131,006
Canada	.....	9,821	.....	422,765
Other countries	.....	123,109	.....	1,245,439
Total	.....	\$208,096	.....	\$2,395,931

Boots and shoes—dozen pairs	.....	\$95,441	.....	\$602,534
Insulated wire	.....	357,069	.....	1,616,227
Submarine cables	.....	291,440	.....	1,717,335
Automobile tires and tubes	.....	273,837	.....	2,951,055
Motorcycle tires and tubes	.....	40,514	.....	359,349
Cycle tires and tubes	.....	234,024	.....	1,871,946
Tires not specified	.....	52,435	.....	497,232
Manufactures not specified	.....	457,341	.....	4,624,081

EXPORTS, FOREIGN AND COLONIAL.

Unmanufactured—				
*Crude Rubber:				
To Russia	4,898,200	\$2,632,837	24,150,600	\$12,930,686
France	827,300	465,821	13,669,600	7,680,866
United States	5,001,200	2,823,816	78,104,100	42,135,763
Other countries	1,223,300	709,677	16,232,000	8,973,368
Total	11,950,000	\$6,632,151	132,156,300	\$71,720,683

Waste and reclaimed	27,500	\$3,766	635,800	\$96,238
Gutta percha	106,000	30,253	829,000	352,544

Manufactured—				
Apparel, waterproofed	.....	\$239	.....	\$2,367
Boots and shoes—dozen pairs	4,802	27,649	1,177,100	83,019
Insulated wire	.....	2,614	.....	32,338
Automobile tires and tubes	.....	258,887	.....	2,565,681
Motorcycle tires and tubes	.....	2,711	.....	61,931
Cycle tires and tubes	.....	3,349	.....	108,402
Tires not specified	.....	.....	.....	31,172

*Included in "Rubber" prior to 1915. After 1914 "Rubber" is separated into "Raw" and "Waste and Reclaimed."

YEARLY EXPORTS AND IMPORTS OF CRUDE AND
MANUFACTURED RUBBER BY COUNTRIES.

Exports—Crude Rubber.	1912.	
	Pounds.	Value.
Venezuela—		
To Germany	224,316	\$140,496
United States	66,014	41,642
France	14,940	8,937
Great Britain	86,489	71,361
Total	987,859	\$637,436
1912-1913.		
Belgium—		
To Great Britain	1,763,005	\$1,578,691
Hamburg	1,993,253	1,784,867
Lubeck	109,534	98,082
Norway	12,896	11,548
Netherlands	16,709	14,962
Portugal	2,223,978	1,991,471
Russia	44,829	22,233
Sweden	17,177,894	3,761,115
Switzerland	353,091	316,177
Other countries	60,843	41,482
Total	10,738,390	\$9,635,739

Imports.	1913.	
	Pounds.	Value.
Russia—		
To Great Britain	\$263,104
Germany	541,980
Holland	15,344
Austria-Hungary	6,175
Denmark	11,779
Japan	4,386
France	6,792
United States	113,271
Other countries	1,566
Total	\$476,607

Exports—Balata.	1913.	
	Pounds.	Value.
Africa, Nigeria	1,144,016	372,902
B. W.—Gold Coast Colony	1,287,942	645,133
B. W.—Camibia	12,995	2,548
Bolivia	11,315,060	9,866,813
British India—Madras	Value.
Calcutta	\$2,046,294
Costa Rica	\$2,369,201
Ecuador	5,762
Guatemala (to United States)	26,266
Nicaragua	104,614
Peru	427,235
Quebec District (to United States)	62,43
San Salvador (to United States)	13,177
Venezuela	487,150
Siam	562,000
Tobago	Value.
Uganda	\$15,973
	10,350
	402,000
	1913-14.
	1914-15.
	Pounds.
	Value.
	33,431
	543
	22,056

EXPORTS—BALATA.

Imports—Crude Rubber.	1911.	
	Pounds.	Value.
Uruguay	.....	.....
Belgium—		
From France	2,575,197	\$2,305,972
Great Britain	4,401,399	3,981,253
Hamburg	1,329,682	1,190,670
India—British	102,681	91,946
India—Dutch	37,239	37,239
Japan	721,629	646,186
Mexico	290,785	260,385
Netherlands	2,462,577	2,205,125
Portugal	1,042,642	933,648
Roumania	95,696	85,691
Switzerland	62,495	55,962
Other countries	33,409	33,409
Total	13,268,761	\$11,951,381

EXPORTS—RUBBER MANUFACTURES.

	1912-1913.	
	Pounds.	Value.
Belgium—		
To Great Britain	183,460	\$209,504
Hamburg	5,722	7,108
India—British	7,033	3,560
India—Dutch	7,033	3,252
Italy	21,594	33,458
Lubeck	3,524	3,296
Netherlands	140,195	109,842
Portugal	8,598	5,998
Russia	6,932	8,442
Sweden	3,865	4,856
Switzerland	12,852	15,590
Turkey	30,312	13,022
Other countries	18,539	12,145

Total 448,424 \$435,073

1913. 1914.
Value. Value.

Austria-Hungary (to United States) \$35,833 \$69,377
Germany (to United States) 49,795 40,537

Russia—

To Germany	\$993,564	.....
Finland	485,310	.....
Turkey	275,241	.....
Sweden	99,358	.....
Persia	57,693	.....
Great Britain	395,307	.....
Belgium	189,241	.....
China	88,211	.....
Other countries	431,161	.....

Total \$3,015,086

IMPORTS—RUBBER MANUFACTURES.

	1911.	
	Pounds.	Value.
Uruguay—		
From United States	\$4,417
Germany	11,591
Argentina	754
Belgium	9,039
Spain	96
France	7,264
Italy	4,168
Great Britain	17,684
Total	\$55,013

	1911-1912.	
	Pounds.	Value.
Turkey—		
From Great Britain	\$479,656
Austria	261,109
Germany	186,761
France	90,078
United States	192,179
Total	\$1,209,783

German S. W. Africa (1912) \$16,732

	1912-1913.	
	Pounds.	Value.
Belgium		
From Great Britain	978,100	\$543,123
Hamburg	12,390	6,992
Italy	271,610	264,799
Netherlands	61,373	33,119
Russia	44,312	31,120
Sweden	34,439	9,938
Switzerland	20,504	17,133
Other countries	4,385	1,122
Total	1,427,113	\$907,346

1913. 1914.
Value. Value.

China, Hankow \$16,079 \$7,918
Costa Rica 19,823
French West Indies 2,852 299
Karachi 30,815 28,613

Nicaragua—

	1913. Value.	1914. Value.
From United States	\$21,961	\$19,824
Germany	4,484	2,455
England	2,526	1,834
France	1,796	1,067
Italy	53	25
Spain	27	.....
Costa Rica .....	.....	25
Other countries	390	1
Total	\$31,231	\$25,831

Canada—Quebec District

	1913.	1914.
From United States	\$14,323	\$11,448
Other countries	27,194	26,509

Total \$41,513 \$32,348

Tripoli (from United States) \$675 \$850

Turkey 27,610

Union of S. Africa—

	1913.	1914.
From Great Britain	\$141,230	\$131,490
Germany	14,610	14,610
United States	14,610	14,610
Other countries	4,870	4,870

Total \$175,320 \$165,580

1913-14. 1914-15.

Calcutta \$675,195 \$885,760

Siam 116,508 103,702

THE RUBBER SCRAP MARKET.

QUIET best describes the market for scrap rubber of late, following the excitement that prevailed over prices at the beginning of the month. In some quarters shoes were reported easier, though current quotations do not bear this out. The flurry in prices served to bring out some unexpected lots, but not in sufficient quantity to affect the market, the figures consumers offered being no inducement to dealers. Some reclaimers asserted their ability to pick up small quantities at ten cents and even a little lower.

Tires being in fairly liberal supply the situation and immediate outlook in this branch are irregular and uncertain, though prices are quite strong. Dealers, however, report increasing stocks on hand, which does not make for higher prices, and unless the price of crude rubber makes the advance foretold tires are likely to remain at prevailing figures.

Mechanical scrap is very firm in price and in good demand, particularly matting, packing and hose, garden hose being in special request.

NEW YORK QUOTATIONS FOR CARLOAD LOTS DELIVERED.

December 30, 1915.

	Per Pound.
Boots and shoes	\$0.10%
Trimmed awties .....	.0812
White tires, Goodrich and Goodyear .....	.1234
Auto tires, standard white .....	.0538
Auto tires, standard mixed .....	.0538
Auto tires, striped, unguaranteed .....	.0312
Auto pechins, No. 1 .....	.09
Inter tubes, No. 1 .....	.0714
No. 2 .....	.27
red .....	.1234
Irony tires .....	.01
Bicycle tires .....	.0514
Solid tires .....	.0514
White scrap, No. 1 .....	.1112
White scrap, No. 2 .....	.0914
Red scrap, No. 1 .....	.0512
No. 2 .....	.0714
Mixed black scrap, No. 1 .....	.0314
No. 2 .....	.03
Rubber car springs .....	.0312
Horse shoe pads .....	.0312
Matting and packings .....	.0114
Garden hose .....	.0114
Air brake hose .....	.0514
Cotton fire hose .....	.0214
Large hose .....	.0112
Hard rubber scrap, No. 1, bright fracture .....	.23
Battery jars (red compound)0212
Insulated wire stripping0212
Rubber heels0312



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WHY RUBBER DEALERS ARE NOW ON THE "BULL" SIDE OF THE MARKET.

An explanation of the apparent anomaly of a "rising market on increasing stocks" is afforded by the changed attitude of dealers. Under the auction system, before the war, rubber was constantly coming into the market in unlimited quantities to be sold at any price the dealer chose to give. The effect of this was to make persistent bears of the dealers who were interested in getting the rubber at lowest figures for subsequent re-sale to consumers at a profit. The war changed things. The embargo on exports, delays and uncertainties in transportation and delivery, so interfered with supplies that the dealers became interested in obtaining better prices for the stocks on hand, and from bears were transformed into bulls.

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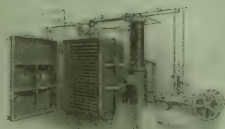
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RUBBER CLUB DAY.

WEDNESDAY, February 2, is slated by The Rubber Club as a day apart. With New York as a center and the Waldorf-Astoria as a rallying place, the rubber trade will assemble to listen to committee reports, discuss trade topics, elect officers and enjoy the annual banquet. For all this, extensive preparation has been made and a most enjoyable and profitable reunion is assured. The subject that the distinguished speakers will discuss is that vital of all topics, "National Defense."

TIRES AND THE RUBBER SUPPLY.

IF prophets are not false, the quantity of rubber required in 1916 by the United States alone for its automobile tires will amount to practically half of the world's production last year.

Taking the figures of the Automobile Chamber of Commerce, that 2,400,000 cars were in use in the United

States during 1915, and increasing it by 1,200,000 for 1916, as estimated by the same authority, the indications are that in this country there will be 3,600,000 automobiles by the end of 1916, less perhaps 200,000 withdrawn from service.

Allowing five casings and five tubes for each of these 3,400,000 automobiles and figuring 42 pounds as the amount of crude rubber contained in the average car's tire equipment, 71,400 tons of rubber will be needed in 1916 for tires.

In the world outside of the United States, according to "The Horseless Age," there were 714,000 automobiles in 1915. Discarding 10 per cent. of these and allowing an increase of 25 per cent. for new cars, the indications are that about 17,243 tons of crude rubber will be required for tire equipment. This, added to the amount of rubber needed for casings and tubes in the United States, will bring the world's demand to nearly 89,000 tons for rubber to be used in tires this year.

The supply of rubber from all sources amounted to approximately 146,000 tons in 1915 against 120,380 tons in 1914, and 108,400 tons in 1913. Allowing for an increase of 22 per cent. in the rubber production during 1916, the yield will amount to 178,000 tons. These figures indicate that this year tires will consume a larger percentage than ever before of the world's largest crop of crude rubber.

Assuming that the number of tires scrapped in 1916 will amount to two-thirds of the year's equipment of casings and all of the inner tubes, there will be approximately 183,000 tons of scrapped tires—the rubber from which will be a goodly addition to the world's supply.

FIRE HAZARDS IN RUBBER FACTORIES.

WHILE the extensive conflagrations that in the olden times wiped out complete rubber plants have not occurred of late, the fire peril still exists.

The greatest fire hazard in the rubber factory is solvent naphtha, which is fairly safe when liquid but dangerous when vaporized. The explosive properties of naphtha, when mixed with air, are well known and too often disregarded. The need of ample means of ventilation to draw this explosive mixture from workrooms cannot be too strongly emphasized. Properly ventilated factories are more free from fire, more pleasant and healthful for the employees. In modern rubber factory construction much attention is given to the providing of adequate heating and ventilating systems with the object of obtaining greater efficiency from the employees than was possible

with methods in use some years ago. This incidentally greatly reduced fire hazards.

Spreader fires, one great danger in the proofing of rubber, apparently occur during periods of low atmospheric humidity, according to the examination made by F. J. Hoxie, a prominent insurance investigator, which is printed elsewhere in this issue. From his findings it would appear that there is a reasonable probability that this class of fires may be largely prevented by artificially maintaining sufficient humidity.

These fires occur chiefly during the winter months, the period of dry air, of low relative humidity. Summer, with its moisture-laden atmosphere, with high relative humidity, appears to be practically free.

It would seem that manufacturers should determine whether Mr. Hoxie's theory is correct. If it is, the number of spreader fires can be materially reduced, perhaps entirely eliminated. Adding moisture to the air in the spreader room, or in any part of the factory where low humidity may increase the fire hazard, is a simple matter.

A small jet of steam opened in the room when the relative humidity drops below 40 per cent. will accomplish the purpose, although a moistening device in connection with a blower heating system, if warmth is provided by that approved method, will be found equally efficacious and will transfer the responsibility of humidifying the air from the foreman to the engineer.

The addition of a direct reading hygrometer, an inexpensive instrument showing humidity, will form an acceptable addition to the equipment of the spreader room, or any room in which rubber cement is used. This would enable the foreman to tell at a glance whether more moisture is required in the air, not only with a view of reducing fire risk but also to improve the quality of the product, which is said to be better when made under conditions of the higher humidity.

Of course, as a rule rubber manufacture is better done in dry than in moist air. Indeed, much time and money are spent in taking all moisture from rubber compounding ingredients and fabrics and the goods are the better for it. It is a question, therefore, if damping the air of even a spreader room will be looked upon with favor. Certainly the suggestion that dry heaters be equipped with sprinklers will not appeal to the manufacturer.

Since the insurance interests have made material reduction in rates for factories possessing fire protection equipment and have added charges for those offering particular hazard, rubber manufacturers have found it to their advantage to add sprinkler systems, standpipes with hose, extinguishers and numerous pails of sand. They have taken precautions never before practiced, and perhaps previously thought unnecessary. The results have been a saving of money

in premiums and of that loss attendant to every fire that cannot be covered by insurance—delay, worry, extra work, cancelled orders.

Manufacturers will find it well worth while to reduce fire hazards to the minimum, to supply proper fire fighting equipment and to train men in each department how to act in case of emergency. Constant vigilance is the only safeguard.

THE TRIUMPH OF THE "SCULPTURED" TREAD.

FOR some years past anti-skid treads, were they "Bailey," "Nobby," "Staggard" or "Squeegie," were things abhorred by the great Michelin company. "Sculptured" treads they called them and most wittily they lampooned them in prose and verse. In serious earnest, also, their experts proved that the "sculptured" tread was not the equal of the smooth tread, and their reasoning seemed sound. In spite of this, however, every tire company kept its special anti-skid, new companies added theirs until it seemed as if all possible designs had been exhausted. Then, and only then, the Michelin company, realizing perhaps what they had known all along, that tire users craved anti-skids, brought out one of their own. It isn't exactly a "sculptured" tread, but it is recessed, and it is an anti-skid. The Michelin company gracefully and effectively bowed to the inevitable.

WHERE CABLE STRIPPINGS ARE WELCOME.

OF all types of scrap rubber the condemned rubber-covered cable is the most undesirable. It is utterly, obstinately intractable. It bulks big and bends with reluctance. The owner dislikes to feed it to the alligator shears for fear that some half mile of it may pass muster as good enough for an economical borough or bankrupt republic. Among junk men stories are rife of lots gathered in this fair republic, refused by local reclaimers, shipped to England, sent back, ballasted to Venezuela, sequestered for debt, and finally brought back to rest in a Brooklyn junk yard as far from reclaiming as in the beginning.

But with rubber at \$12 a pound in Germany it is a safe bet that there, at least, no cable strippings are going begging. Too bad the embargo—but that is a forbidden topic.

MANY WONDER JUST WHY THERE SHOULD BE ANY hesitation in allowing hospital supplies of rubber to go into Germany for Red Cross use. They do not appreciate the fact that for purposes of remanufacture for tires, inner tubes or ground sheets, these goods, either new or scrapped, are equivalent to a certain amount of crude rubber. With raw rubber at its present price in Berlin rubber scrap quotations per pound should be as follows: red scrap, \$2; white scrap, \$2.20; automobile tires, \$1; inner tubes, \$.55.

Fire Hazards in Rubber Mills.

IN the matter of fire hazards, every industry has its own individual peculiarities. The manufacture of rubber goods is no exception. Besides the possibilities which are common to any and every manufacturing establishment of similar build and of equal size this industry is subject to some special risks, and therefore the study of the causes of fires is an important one, and the better known they are, the more satisfactorily can they be guarded against, or more quickly extinguished when they occur.

Very thorough and exhaustive researches have been made by insurance adjusters, as well as by chemical experts, as to the principal causes of fires in rubber factories. The result of these studies seems to show that outside of those causes common to all factories, the principal dangers peculiar to rubber manufacture come from the inflammability of the solvents used in the industry, from spontaneous combustion of some of the materials, and from excessive heat in some of the operations. The two latter, however, are but minor hazards; practically the all-important one is in the use and storage of naphtha and similar solvents, and the preparations in-to which these enter.

A careful and comprehensive study of all the processes in the manufacture of rubber, made by Charles E. Macomber, Jr., of the N. F. P. A., has led him to the following conclusions as regards rubber footwear factories:

There is no fire hazard in crude rubber, nor in the process of washing. In drying, he recommends that if the ordinary system of steam coils is used, care should be taken that the pipes are properly installed, resting on iron, bushed where they pass through wooden partitions or floors, and protected by screens, so there will be no danger of stock coming in contact with them. Should a system be in use requiring a fan, additional precautions should be taken.

In the vacuum system of drying there would seem to be no more hazard than there would be in the installation of a steam pump or similar piece of apparatus.

In the mixing rooms there is no material hazard, as the temperatures of the material in process of compounding cannot be carried high, on account of the possibility of spoiling from this cause.

The storage of the various ingredients may constitute a hazard, however. As a rule these materials are stored in the compounding room only in sufficient amounts for immediate use, the bulk being kept in original packages, which are stored in a warehouse or portion of the factory reserved for that purpose. Among the materials which may cause trouble, this investigator mentions lamplblack, which, he says, should be kept dry and stored in small quantities, preferably in metal containers with tightly fitting metal covers, for there are cases when, under cer-

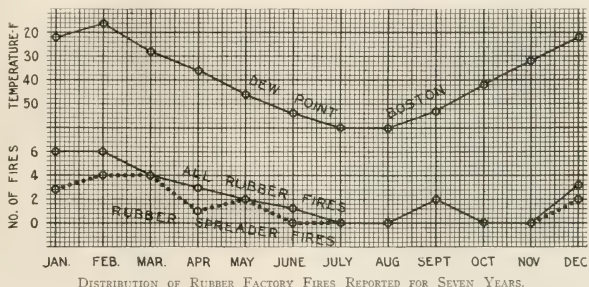
tain conditions, it has been known to heat and ignite spontaneously.

While sulphur is always found, it in itself presents no special hazard, except that its presence would add fuel with the evolution of objectionable gases. There are also stored various oils, resins, waxes and the like, but with proper care these should give no trouble. In fact, this is true of all the material used in the compounding of rubber. He considers that there are no special hazards in calendering, frictioning or impregnating, as the degree of heat is low, owing to the danger of spoiling the compound.

In the making, however, comes the hazard of the use of rubber cement, and to this one preparation is laid the blame for the vast majority of fires in rubber mills. The hazard both of the manufacture and use of this article is due to the solvent used to get the rubber in solution. This is naphtha. The kind generally used and most preferred is that having a specific gravity of .706, 70 degrees Baumé, boiling at 180 degrees F. and flashing and burning

at ordinary temperature.

It is recommended that the manufacture of cement should always be conducted in a detached building away from the main plant, well ventilated, and carried on without the aid of artificial light. If light be necessary, incandescent light should be used, the sockets to be keyless, the wiring run in conduit, the lamps enclosed



DISTRIBUTION OF RUBBER FACTORY FIRES REPORTED FOR SEVEN YEARS.

The upper curve is the monthly average mean of dew points at S. A. M. and S. P. M. at Boston, thus representing fairly well climatic conditions of "working hours" in southern New England. The second curve is the aggregate number of rubber fires reported in twelve factories, distributed by months, in the same seven years. The lowest curve shows the aggregate number of rubber spreader fires reported in seven factories distributed by months during the same period.

in vaporproof globes, and the switches and fuses located outside of the building. The naphtha should be stored in an underground tank located 30 feet or more distant from any building, and pumped as needed to the cement mixing room.

Power for churns (these are best of the enclosed type) should be furnished from outside by means of shaft or some kind of a drive permitting a cut-off opening. While the speed of the churns is necessarily slow (owing to the ease with which rubber is electrified by friction and pressure), as a precautionary measure it would seem advisable to "ground" all of the machinery.

The cement, except that in immediate use, should be stored in tightly covered metal cans. There are cans on the market designed for this purpose.

If the plant be sprinklered the cement house should contain a standard system of automatic sprinklers, and in all cases the cement room should be provided with a steam jet of ample size for smothering fire, having an easily accessible valve located on the outside of the building.

A day's supply only should be brought into the factory, and only enough distributed to the operators for immediate use. At the close of the day that remaining in the small pans should be returned to the container, which should be removed to the cement house.

In some factories naphtha is used for thinning the cement at

the benches. This would seem to present a needless hazard, for the cement is easily made of the proper consistency, and if used in small quantities at a time there should be very little evaporation and thus no call for the addition of naphtha.

Lighting here should be incandescent electric. The making room should have at least half of its fire pails filled with sand and supplied with a scoop for using it, as cement fires are best put out by smothering.

Some of the hazards above mentioned are also applicable to varnish. Some factories manufacture their own varnish. This should always be made in a well-detached building. The building used for the manufacture of cement could be made large and a section of this building could be used, cut off by parapet fire walls, with no openings into the cement section. The varnish is made from linseed oil, which is bought, generally, in the raw state and boiled here.

It is the opinion of this investigator that this section should be made thoroughly fireproof, and that sprinklers might be omitted. Floor should be concrete and fitted with a drain leading to a blind pit of ample capacity, located 50 feet or more from any building.

The vessels in which the oil is boiled should be sufficiently large, so that the oil can in no way boil over. Coke or hard coal, it is believed, is best for fuel. Gas is sometimes used, but might cause danger, owing to drafts.

Varnish also contains rosin or some cheap varnish gum; also sulphur in small amounts.

After the varnish is boiled for a proper length

of time it is thinned down with naphtha. This hazard is similar to the cement hazard, and the naphtha should receive the same treatment here.

Varnish should be stored in strong metal tanks, and pumped out as needed. It is often brought to the factory in pails. The best way would seem to be a system by which it can be pumped to the place where it is used. The investigator has seen an installation where the pump is controlled by an electric device in the varnish room, arranged so that the pump can be started up or shut down at will. The piping is arranged to pitch back to the pump, so all varnish drains back to storage tank when pump is stopped. The amount of varnish in the factory should be limited to a day's supply.

Lighting in this department should be incandescent electric. Varnish room should be well ventilated and cut off from the main plant and vulcanizer room. Dip tanks, if used, should be installed to conform, where practicable, to the rules and requirements of the National Fire Protection Association.

Dry heaters for vulcanizing should be located in a well cut-off section. The tin lining should be standard, and attention should be given steam pipes to prevent contact with all inflammable material. They should be provided with a steam jet having an easily accessible valve, so they could be flooded with steam if necessary.

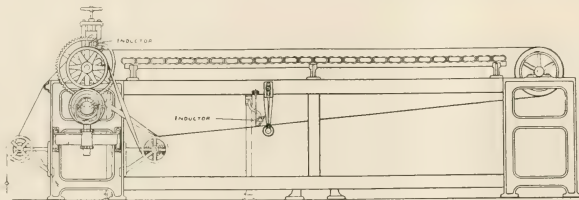
They should also be protected by a standard system of automatic sprinklers, although the manufacturers, almost without exception, take issue to this, owing to the fear of premature opening of the sprinklers, as the presence of water during the vulcanization process would ruin the goods.

The foregoing hazards, or some of them, and the precautions recommended apply practically to all rubber factories. But besides these are others applicable to the manufacture of rubber-coated fabrics. Our readers are familiar with the operation of the spreading machines, and know of the danger of ignition of the naphtha fumes from sparks of static electricity, which is generated in the fabric by friction and pressure. This, according to another investigator, has been found to be very largely a matter of humidity, which will be referred to later.

The dough or spreading mixture is simply compounded rubber which by means of naphtha and churning has been made of a dough or cement-like consistency. The hazard of manufacture of this material should be safeguarded in the same manner as described for the manufacture of cement.

Spreading machines should be located in a detached or well

cut-off section of the plant. The hazard of the operation is entirely due to the presence of the naphtha used in the spreading compound. Rubber being easily electrified by friction and pressure, and as it is thought by some engineers that the evaporation of naphtha also causes this phenomenon, the spreading machine should be equipped with devices for removing these static charges.



THE CHAPMAN NEUTRALIZER.

In the application of the Chapman neutralizer to spreading machines, the transformer is located on some convenient wall and a single heavily insulated wire leads to the several machines to be treated. Each spreading machine is fitted with two "inductors" extending across the machine over the fabric. One is placed just back of the spreading knife and the other near where the fabric is rolled up. The positions of these inductors are shown above.

These inductors are placed so that the fabric passes them at a distance of from two to four inches. The influence of the inductors extends through the air for several inches around them, and every portion of the fabric as fast as it comes within this region of influence is inseparably but instantly deprived of any electric charge existing upon it.

The result of this action is that the inductor at the head end of the spreader instantly and completely neutralizes every part of the fabric as fast as it leaves the spreading knife, before any charge imparted to the fabric can accumulate sufficiently to discharge to the roll, knife, frame or pipes in the form of a spark.

The object of the other inductor, treating the fabric just before it is rolled up, is to remove any slight charge redeveloped by the other rolls over which the fabric passes before winding up.

The methods in use for guarding this hazard are as follows: All metal and moving parts of the machine are well grounded. Directly in front of the knife is located a steam jet. Bearing on the underside of the fabric is a wire which collects any charge which is not broken up by the steam jet.

In some factories the speed machines are equipped with an electric device known as the Chapman Electric Neutralizer, which distributes alternating charges at high voltages in minute quantities to the places where the static charges collect. This works on the principle of the simple law of attraction and repulsion, that the static charge in any insulating material selects for itself the kind and quantity to exactly neutralize itself.

According to investigation made by the Inspection Department of the Associated Factory Mutual Fire Insurance Companies, it has been concluded that if the humidity of the room where the spreading machine is conducted is kept at about forty per cent, there will be little danger of fire from this cause.

As a proof that the chief hazard in rubber factories is due to ignition of the spreading material through sparks of static electricity F. J. Hoxie, a well-known insurance inspector and engineer, gives in graphic form the number of all fires in twelve factories during the seven years previous to 1915, and the number of spreader fires in seven factories during that same period. It will be seen that a very large percentage of all occurring in the

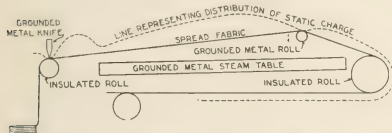
winter were spreader fires. This engineer believes that this fact suggests some peculiarity in the condition of the atmosphere, such as dryness as the probable cause, and calls attention to the humidity of the inside air in the different months. It will be observable that the line thus represented follows remarkably near parallel with that representing the total fires in those months.

Humidity measurements were made on a winter's day in the spreading room of a rubber factory in Canada, while the relative humidity of the room was gradually increasing after a cold morning in which excessive electrification was noticed. Just after static electricity had ceased to be conspicuous on the goods, and at a temperature of 58 degrees F., this engineer found a relative humidity of only 28 per cent. In summer the air from the outside entering this room would have an average relative humidity of from 60 to 80 per cent., or would contain five times as much water per cubic foot.

The observations plotted in the foregoing diagram suggest that a comparatively low atmospheric humidity is sufficient to stop most of the fires caused by static electricity, and that the natural humidity is enough to present fairly safe conditions during the greater part of the year.

The remedy suggested is a simple humidifying device or a small steam jet opened in cold, dry weather. This would be sufficient to raise the humidity in the room above the danger point; also it appears probable that in rubber factories, in addition to preventing fires, a carefully regulated humidity will improve the quality of the goods, although no conclusive data on this point are yet available.

In the rubber spreading room, above referred to, the distribution of electric charge on goods being spread was roughly determined by the use of cotton candle wicking, as an electroscope, while the relative humidity in the room was at about 20 per cent. The following sketch shows the distribution of the electrical charge. An electroscope of worsted fibres would have been somewhat better, but cotton was used, as being at hand. A gold leaf electroscope would probably be found too sensitive for indicating the comparatively large differences of charge.



DISTRIBUTION OF STATIC ELECTRICITY ON FABRIC ON A RUBBER SPREADING MACHINE ON A COLD DAY.

The cause of the electric charge on spread rubber has been attributed to friction at the knife. This may contribute to it, but its distribution would indicate that it is more probably caused by the evaporation of the solvent from the cement or from some unknown chemical action, such as oxidation or change in hydration of the rubber or fabric. For example, kerosene passed through wool filter bags can develop a sufficient charge of electricity to ignite the kerosene.

Some experiments carried out in the Factory Mutual Laboratories by Mr. Lawler and Mr. Turkington show that the act of withdrawing a piece of loose wool from a pail of benzene leaves an appreciable electric charge both on the wool and the benzene.

Electrical devices making use of very high voltage alternating current have been applied successfully for neutralizing the static charge on calendared paper. This device has been tried in a few cases on rubber spreaders with doubtful success, and sometimes fires have been directly caused by it.

Ozone from electrical devices, or from the electrified goods themselves, may also have a detrimental effect on rubber, for

ozone appears to be a natural enemy of rubber. One of the old-time practical tests for durability of a sample of rubber was to place it in a closed jar in which ozone was slowly generated by the presence of a small piece of phosphorus.

Last winter, one rubber factory installed a recording hygrometer in a room where much rubber cement is used and where fires have frequently occurred. Whenever the humidity falls below 40 per cent., moisture is blown in or the air is artificially humidified. No fires of importance have occurred in this room since these precautions were taken.

Systematic observations of the relative humidity are now being made along the lines suggested above at several rubber factories. Until more reliable data are available, it will undoubtedly be safe to assume that with a relative humidity of not less than 40 per cent., the tendency to fires from static electricity about rubber cement will be much reduced, with no damage to the goods.

Mr. Hoxie advises that a reliable hygrometer be kept in each churn room or spreading room of a rubber factory, and, when the natural humidity falls below 40 per cent., artificial humidity should be introduced. This can be done by a steam jet or by some of the various forms of humidifiers used in cotton spinning rooms and weave rooms.

THE RUBBER CLUB BANQUET.

ON account of the change in the date of the sixteenth annual banquet of The Rubber Club of America, Inc., from January 28 to February 2 to better suit the convenience of the members, the annual and other meetings were postponed to February 1 and 2, as shown in the accompanying schedule:

- FEBRUARY 1, 6:00 P. M.—Meeting of Executive Committee of The Rubber Club of America, Inc., at the Union League Club.
- FEBRUARY 1, 7:00 P. M.—Meeting of Executive Committee of the Rubber Sundries Manufacturers' Division at the Union League Club.
- FEBRUARY 1, 7:30 P. M.—Meeting of the Present Board of Directors of The Rubber Club of America, Inc., at the Union League Club.
- FEBRUARY 2, 2:00 P. M.—Annual meeting of the Rubber Sundries Manufacturers' Division at the Waldorf-Astoria.
- FEBRUARY 2, 2:00 P. M.—Annual meeting of the Mechanical Rubber Goods Manufacturers' Division in the East Room of the Waldorf-Astoria.
- FEBRUARY 2, 3:00 P. M.—Annual meeting of The Rubber Club of America, Inc., in the Myrtle Room of the Waldorf-Astoria.
- FEBRUARY 2, 4:00 P. M.—Meeting of the newly elected Board of Directors of The Rubber Club of America, Inc., at the Waldorf-Astoria.
- FEBRUARY 2, 7:00 P. M.—Annual banquet of The Rubber Club of America, Inc., in the Astor Gallery of the Waldorf-Astoria.

With a good attendance assured, the banquet promises to be a notable occasion. The following speakers, who have been announced, are men of national reputation: Edward N. Hurley, Chicago, Illinois, vice-chairman of the Federal Trade Commission; Edward D. Estabrook, New York City; Hon. Harry M. Daugherty, Columbus, Ohio, and Rev. W. Warren Giles, East Orange, New Jersey. The invocation will be given by Rev. George R. Van De Water, rector of St. Andrews Protestant Episcopal Church, New York.

Dr. E. E. Pratt, chief of Bureau of Foreign and Domestic Commerce, Washington, D. C., has accepted an invitation to be present.

For the convenience of club members and also of the press, there will be a complete stenographic report made of the speeches and addresses given at the banquet.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World

The New York Automobile Show.

A LL records in attendance and number of exhibits were broken at the sixteenth annual National Automobile Show held at the Grand Central Palace, New York City, from December 31 to January 8. As generally expected, the most prominent tire manufacturers did not exhibit, but the many cars shown were equipped with standard tires and tops made of standard fabrics. Among the many exhibits of tires

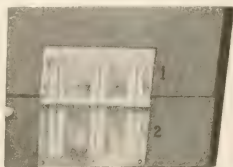
Louisville, Kentucky, attracted much attention on account of its puncture-closing qualities.

In the booth of the Essex Rubber Co., Inc., Trenton, New Jersey, there was exhibited an attractive line of blue, red and gray inner tubes, together with patches, reliners and other automobile accessories.

Shown in a prominent position on the fourth floor, a large



THE LUKINS HOSE CLAMP.



THE "PRE-TO CAR-COOL."



STANWOOD SAFETY STEP PLATE.



NEW TREAD OF DAYTON TIRE.



THE BROWN SCIENTIFIC TUBE.



MICALITE EYE SHIELD.

and automobile accessories that helped to make the show interesting and instructive were the following:

TIRES AND TUBES.

The new tread of the Dayton tire, illustrated herewith, which has a heavier central rib than the former design, was shown, together with the Dayton airless tire, by the Dayton Rubber Manufacturing Co., Dayton, Ohio.

The Marathon "Whip-Cord" tires and tubes attracted attention to the booth of the Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio.

Many people were interested in watching a tire-maker build up "Sterling" tires on a tire core jack at the exhibit of the Rutherford Rubber Co., Rutherford, New Jersey. Beside tires and tubes, this company displayed the "Sterling" red fiber mat for Ford cars.

Double fabric tires and "Anti-Pinch," "Double Rubber" and red "Interlock" inner tubes constituted the display of the Double Fabric Tire Co., Auburn, Indiana.

The "Victory" tire, of molded cellular construction, sealed by the base strip and the tread, was exhibited by the Milne Tire Co., Inc., New York City.

Story & Reed, New York City, demonstrated the air-retaining qualities of the "Brown Scientific" tube, which is claimed to be self-closing when punctured, and of which a cross section view is reproduced. This tube, which is made with an extra thick tread, has a strip of non-stretchable fabric vulcanized into the tread close to its inner surface. The tube is then turned inside out and the ends joined. As the larger outside circumference becomes the inner circumference, the rubber on the inside is always compressed, thus rendering puncture holes self-closing. The "Miller" pneumatic tire was shown in the same booth.

Another inner-tube of thick rubber, called the "Compression," and manufactured by the Compression Inner Tube Co., Inc.,

line of tubes, patches, reliners, cushions and specialties manufactured by the Voorhees Rubber Manufacturing Co., Jersey City, New Jersey, received much attention from the visitors.

REPAIRING DEVICES.

The Adamson Manufacturing Co., East Palestine, Ohio, made an attractive exhibit of its various vulcanizers, kits and repairing devices, including the new "Model H" vulcanizer, designed to accommodate three tubes at a time and provided with a hood for carrying off fumes.

"Magic Rubber Mend," a quick vulcanizing rubber preparation for repairing tubes, boots and other rubber goods, was shown by the Eastern Rubber Co., Philadelphia, Pennsylvania, and attracted much attention, as did the "Cementless Cure" patches manufactured by Charles O. Tingley & Co., Rahway, New Jersey.

For the prevention of tire troubles, the Newmastic Co., New York City, exhibited sections of tubes that had been filled with "Newmastic," a preparation injected through the air valve, and the Woodbridge Chemical Co., New York City, demonstrated its preparation, "Air-In-Air."

Re liners, boots, patches and accessories were shown by Paul G. Niehoff & Co., Chicago, Illinois; the Polson Rubber Co., Kansas City, Missouri, and the General Tire & Rubber Co., Akron, Ohio.

Stevens & Co., New York City, exhibited the "Sampson Feather-Edge" inner tube plug for tube repairs; the Spittler Puncture Plug Co., New York City, showed its line of "Spittler" puncture plugs, and C. A. Shaler Co., Waupun, Wisconsin, presented a display of repair vulcanizing outfits.

OTHER TIRE ACCESSORIES.

An exceedingly interesting exhibit of the Schrader "Universal" tire pressure gage, valves, valve accessories and repair tools

and outfits was made by A. Schrader's Son, Inc., Brooklyn, New York.

The following is a list of other tire accessories of interest with the names of the manufacturers or agents making the exhibits:

"Off-An-On" tools for clincher tires and Stewart "Correct" tire carriers; Stewart Accessories Co., Detroit, Michigan.

"Warland" dual rims; Fryer-Auster Co., Providence, Rhode Island.

The "Twin-Rim"; Be-Be-Co., East Cambridge, Massachusetts.

Friedstied rim contractor for straight side and clincher split rims; Friedstied Rim Contractor Co., Chicago, Illinois.

"Utility" tire pump, to be attached to the spark plug hole; Hill Pump Valve Co., Chicago, Illinois.

"Detroit" gearless, motor-driven tire pump; Detroit Accessories Corporation, Detroit, Michigan.

Portable and stationary air pumps for garages and tire shops; Lipman Air Appliance Co., Beloit, Wisconsin.

ACCESSORIES FOR AUTOMOBILES.

The Stanwood safety step plate, intended to prevent the tracking of mud or dirt into the car and to insure a secure foothold, as shown in the accompanying illustration, consists of a perforated steel plate covered with rubber and having 24 ribs. This was displayed by the Onguard Auto Necessities Co., Detroit, Michigan.

Another device to protect the automobilist is the Micalite eye-shield. As will be observed in its illustration, this eye-shield, which is made in two colors in one piece, is bound with split rubber tubing and is held in position on the head by rubber bands. It is manufactured by Strauss & Buegeleisen, New York City.

Charles E. Miller, New York City, with branches in the principal cities, showed a large number of automobile sundries, among which was the "U-Can-C" windshield protector, a celluloid hood, to be attached to the glass windshield by means of rubber vacuum cups, in order to prevent rain and snow striking the part of the glass thus protected.

The "Presto Car-Cool" for Ford cars, a device to prevent heat from radiating through the lever slots, was shown by the Metal Specialties Manufacturing Co., Chicago, Illinois. From the illustration, it will be observed that the lever slots are closed by rubber strips held in position by a metal frame. These strips, while permitting free use of the levers, prevent the heat from passing through the slots.

Among the electrical exhibits were the General Electric Co., Schenectady, New York, showing mercury rectifiers in operation, and the Westinghouse Electric & Manufacturing Co., Pittsburgh, Pennsylvania, displaying lighting, starting and ignition devices. The magneto and storage battery manufacturers were well represented and made attractive exhibits of their products.

An automobile cigar lighter, to be connected with the lighting system of a motor car, was shown by the Electric Automatic Cigar Lighter Co., New York City, and a self-winding electric clock was exhibited by the Hartford Clock Co., Hartford, Connecticut.

The Lowe Motor Supplies Co., New York City, displayed its line of automobile sundries.

OTHER INTERESTING EXHIBITS.

Much interest was shown in the Elkin hose clamp, here illustrated. As will be seen, the hose to be connected is slipped over the metal nipple of the clamp. The hinged arms are then folded over the hose and the ferrule is screwed down over these arms, which are thus securely impressed into the hose, forming a tight joint. This clamp is manufactured by Charles Elkin, New York City.

A large space was occupied by the General Bakelite Co., New York City, in which many samples of bakelite were shown, including the process of molding with a hydraulic press.

The "Bull Dog" and other waterproofed fabrics manufactured by the L. J. Mutty Co., Boston, Massachusetts, constituted an attractive display of samples of materials for automobile tops.

Among the novelties which attracted attention was the "B-P-C" clothes protector, an apron-like garment fastening over the front of the coat and trousers by means of springs, and made of a material which it is claimed is not affected by oil, gasoline or water.

Samples of automobile trimming, covered with jet black hard rubber, were exhibited by the Rubber & Celluloid Harness Trimming Co., Newark, New Jersey. At the same booth "Rosylite" dressing for real and artificial leather was demonstrated.

The Standard Woven Fabric Co., Framingham, Massachusetts, and the Woven Steel Hose & Rubber Co., Trenton, New Jersey, made attractive displays of brake lining and friction materials.

The Morse "Rocker-Joint" silent chains, as used on the motors of many of the higher-priced cars, were shown in position on automobile engines, by the Morse Chain Co., Ithaca, New York.

COLONEL COLT PREDICTS UNPARALLELED ACTIVITY.

Prosperity in the rubber industry and an increase in prices are predicted by Colonel Samuel P. Colt, president of the United States Rubber Co., New York City, in his review of the rubber situation printed in the "Journal of Commerce." He said in part:

My firm belief is that we may witness unparalleled activity in general business as a result of the European war, while it lasts, and for two or three years after it culminates. We are today feeling the stimulating effect of the European upheaval.

So far as the rubber industry itself is concerned, it has in general responded to this change for the better. Our mills, over 40 in number, which are located in different parts of the United States and Canada, are running fuller and employing more men and women today than ever before in the history of the company, and with every indication that our plants will be kept busy for some time to come. In fact, we are so encouraged by the present condition that we have taken steps to put in operation certain unused manufacturing facilities as well as to enlarge the capacity of other plants in operation. Although direct war orders have helped the position of the rubber manufacturers' market, it is gratifying to point out that the improvement in large part has been in our domestic demand for goods.

Touching the 1915 prediction, it is estimated that Brazil turned out 35,000 tons, the Far East 100,000 tons of plantation grades, and various other points, 15,000 tons of wild rubber. It is anticipated that the consumption of the world has increased 20 to 30 per cent. I look for this to be taken care of by the enlarged production during 1916. The present high values are an incentive to all producers to increase their output to the maximum capacity. In the East the largest planting was done in 1910, which will come into bearing in 1916. We look for that output to be 140,000 to 150,000 tons. Brazil will not increase in the same ratio, although I look for a decided increase there and in other countries where wild rubber is gathered.

Without doubt, existing conditions will necessitate an advance at an early date in all lines of rubber manufactures. The demand and consumption of crude rubber was never as great as at present. I look for general good business in all lines of rubber manufactured goods for the next two or three years to come.

THE ROLL OF HONOR OF THE MALAY STATES.

"The Roll of Honor and List of Malay States Men Serving" is the title of a 16-page supplement to the "Malay Mail" of October 25, 1915, that contains the names of 788 officers and men who are serving in the war. These names are divided into three lists, the English born containing 723, the French born 30, and the native born 35 names. The name, profession, local address, rank and regiment of each person is noted. Information is also given regarding the wounded, killed and missing. It is particularly noticeable that the majority of those listed hold commissions, some of which are of high rank. The majority of the names appearing are those of planters, although persons in all walks of life are listed.

What the Rubber Chemists Are Doing.

PRESIDENT RICHARD C. MACLAURIN, of the Massachusetts Institute of Technology, in a recent address before the New York Section of the American Chemical Society, said:

We are hurt here (in America) by the prevalence of the spirit of trade secrecy. Of course, we recognize a large part of what is thought of as "secret" is really widely known, and there is much knowledge of value that could be disclosed without any detriment whatever to the reveler.

There is still with us too much of the spirit of the pre-scientific days and too much reliance on "rule of thumb." Old-fashioned superintendents are still constantly employed who have no knowledge of science and little faith in it. Practical men must not be so scornful of what is obvious to men of science.

When the war is over the conditions of competition will be peculiarly severe, but the war should have given our chemical industries a new start and a fresh impetus, and if our range of vision is long and our enterprise does not fail, the future of chemical industry in this country should be bright indeed.

ARTIFICIAL RUBBER FROM VODKA.

Since the outbreak of the war, when the sale of vodka in Russia was prohibited, the Imperial Minister of Finance has instituted researches to adapt the national intoxicant to technical purposes which would permit the government to profitably dispose of the 260,000,000 or more gallons now in stock. In a recent issue of the Petrograd "Nowje Wremja," a chemist named Ostromyslensky is credited with having discovered a process for making artificial rubber from vodka so successfully that the government has decided to erect a large plant for manufacturing "vodka rubber."

In this connection it should be noted that United States patent 1,161,904, recently granted to David Spence and Alexander P. Clark, assignors to The B. F. Goodrich Co., covers a process for obtaining rubber-like substances from alcohols. [THE INDIA RUBBER WORLD, January, 1916, page 169.]

METHODS OF ANALYSIS.

DETERMINATION OF SULPHUR IN RUBBER.—The following method was devised by Dr. Ludwig Rosenstein:

Weigh out exactly 0.5 gm. of the finely ground sample in a 300 cc. Erlenmeyer flask. Add 15 cc. of a saturated solution of arsenic acid, 10 cc. of fuming nitric acid and 3 cc. of saturated bromine water. Cover with a watch glass and boil until the sample is completely oxidized and a clear solution is obtained, adding more fuming nitric if necessary to complete the oxidation. Evaporate to syrupy condition, then add a few crystals of potassium chlorate to insure complete oxidation and to expel oxides of nitrogen. Continue the evaporation almost to dryness to insure complete expulsion of oxides of nitrogen. Cool and take up with 50 cc. of 10 per cent hydrochloric acid, heat on steam bath until solution is complete, filter to free from any insoluble matter and dilute the filtrate to about 300 cc. From this solution the sulphur, which has been converted to sulphate, may be precipitated with barium chloride. Filter and weigh, observing the usual procedure and take special precaution that precipitate be filtered from the hot solution and washed with hot water to remove any lead salts.

The function of the arsenic acid is to raise the boiling point of the solution during the oxidation, thus making it more complete and rapid. It may be prepared by adding C. P. arsenic oxide to boiling water until boiling point of the solution is 140 degrees C.

This method has been found rapid and accurate to within less than 0.1 per cent on rubber mixings, both cured and uncured containing known amount of sulphur, with and without various compounding ingredients.

ELECTROLYTIC METHOD FOR LEAD AND ZINC IN RUBBER COMPOUNDS.—The following method, by Elmer D. Donaldson, is of interest. The portion relating to the deposition of zinc on platinum direct is adapted from a recently published method by W. S. Kinley used for determining zinc in bronze and brass.

Donaldson's method consists of digestion of the ash in nitric acid and precipitation of lead as peroxide (PbO_2), followed by evaporation and precipitation of zinc as metal, both on platinum. The electrolytic apparatus was equipped with a rotating electrode and pole-reversing switch. The larger electrodes were of platinum gauze $1\frac{1}{2}$ inches wide by 2 inches high, sand blasted, and the rotating gauze $\frac{1}{2}$ inch wide by 2 inches high. The apparatus was connected to a 110 volt direct current generator and lamp resistance.

Lead—Weigh 1 gram rubber, wrap in a 7 centimeter ashless paper and incinerate in a 20 to 30 cc. porcelain crucible. Brush the ash into a 200 cc. electrolytic beaker, add 25 cc. concentrated nitric acid, and digest on hot plate for 15 minutes. Boil to expel nitrous fumes and dilute to about 125 cc., having solution at 158 degrees to 176 degrees F. Electrolyze with rotating cathode, using direct current of two to three amperes. The lead will appear on the large gauze anode as peroxide, black when in large amounts, bronze colored when in small amounts. Electrolyze 30 minutes and wash anode thoroughly with water to remove mechanical impurities, then with alcohol and ether. Dry for 30 minutes at 338 degrees F. Weigh as peroxide of lead (PbO_2) and for convenience calculate to litharge (PbO), using the factor 0.933. No metals present in rubber mixings will interfere with this determination.

Zinc—Wash the solution and the insoluble matter from the electrolytic beaker, from which the lead has been removed, into a litre beaker. Add 5 cc. concentrated sulphuric acid, evaporate dry, and drive off most of the sulphuric acid. This is done to insure complete removal of nitric acid, which would interfere with the electro deposition of zinc. After evaporation, cool and digest residue, which usually contains considerable insoluble, with 50-75 cc. water. The zinc is now present as zinc sulphate and is readily soluble. Filter and wash. If the zinc oxide content is known to be low use entire filtrate, but if 20 per cent or over, catch filtrate in 200 cc. volumetric flask. Make up to mark and take 50 cc.

Wash this portion of solution representing 0.25 grams of rubber sample into a 200 cc. electrolytic beaker. Add considerable excess of saturated solution of sodium hydroxide over that necessary to redissolve the zinc hydroxide. Electrolyze at ordinary temperature at 2 to 2.5 amperes, rotating the anode for 20 minutes. Remove and wash with water, alcohol and ether. Dry at 212 degrees F. for a few minutes, cool and weigh.

Zinc is deposited on the cathode and is weighed as metal. The weight of zinc is calculated to zinc oxide. Aluminum will not interfere even if the solution is gelatinous from the precipitated aluminum hydroxide. In event that iron is present, filter off the iron hydroxide after adding just enough sodium hydroxide solution to insure solution of the zinc hydroxide. Then add further sodium hydroxide solution to this filtrate. Lead peroxide and zinc can be dissolved from the platinum gauze by concentrated nitric acid saturated with tartaric acid.

PREPARATION OF RUBBER SAMPLES FOR ANALYSIS.—Soft vulcanized rubber of high grade requires to be finely divided for successful analysis by extraction methods. It has recently been suggested by John H. Link to use for this purpose an "Enterprise" food masticator, No. 1 size. Repeated passage through the machine will, in a few minutes, cut an ounce of soft cured rubber sufficiently fine to pass through a 20-mesh sieve.

CHEMICAL TREATMENT OF RUBBER.

THE UNITED STATES.

VULCANIZING RUBBER-LIKE MATERIALS, 1,166,777. Paul I. Murrill, assignor to Revere Rubber Co. Rubber or rubber-like materials are cold cured by subjection to the action of sulphur monochloride and gasoline characterized by the absence of olefins.

RECVLCANIZING RUBBER, 1,166,784. Raymond B. Price, assignor to Rubber Regenerating Co. The process consists of exhausting, heating, and compressing the finely divided material and compressing it under excessive compacting pressure to minimize destructive distillation, then subjecting it to vulcanizing heat, and finally quickly cooling it to check surface vulcanization.

DEVULCANIZING RUBBER, 1,167,359. Henry J. Mayers, assignor to the Empire Rubber Co. The process consists in subjecting the vulcanized rubber to the action of a bath containing de-resinated and de-turpenated oil of pine.

MANUFACTURE OF FROTH FILLINGS, 1,167,518. Fritz Pfeumer. The process comprises the steps of vulcanizing rubber material under a hot high gas pressure, then cooling it under a gas pressure at least equal to that applied during vulcanization, inserting the cooled filling into a casing, and then heating the filled casing to expand the filling until it occupies the interior of the casing. An illustrated article on the material produced by this process will be found in *The India Rubber World*, August, 1915, page 610.

MANUFACTURE OF ISOPRENE AND HOMOLOGUES, 1,168,070. Henry S. A. Holt, assignor to Badische Anilin & Soda Fabrik. The process of producing butadiene hydrocarbons by heating in the vaporized condition while in a state of dilution and in the practical absence of other organic hydrocarbons, the mixture of polymerized products other than caoutchouc-like matter resulting in the polymerization of butadiene hydrocarbons.

RECLAIMING WASTE RUBBER, 1,168,230. Gray Staunton.—Finely ground vulcanized waste rubber is mixed with about 25 per cent. of alkaline carbonate. This dry mixture is heated in an oven for two or three hours at 300 degrees F. The material is then washed to remove excess of alkali.

THE GERMAN EMPIRE.

HARD RUBBER SUBSTITUTE, 289,597 (1915). Hans Blücher and Ernest Krause. By the process yeast is converted into a horn-like substitute for hard rubber by the action of formaldehyde with or without the addition of other substances.

THE SWISS REPUBLIC.

PREPARATION OF FABRICS FOR RUBBERIZING, 68,858. W. E. Muntz, London, England. Fabrics are impregnated with alkaline salts, sodium carbonate and borax, or with basic metallic salts or basic hydroxides which unite with the sulphurous product of vulcanization and prevent injurious effect on the fabric.

PRODUCING BENZOL FROM MINERAL OIL, 69,342. Continental Caoutchouc & Gutta-Percha Co., Hanover, Germany. Mineral oil is subjected to the action of a halogen-aluminum hydrocarbon as a catalyst. It is claimed that the process has important advantages over the cracking process, since it does not require to be operated under pressure; in fact, can be conducted in a vacuum, the benzol obtained being free from disagreeable odor.

LABORATORY APPARATUS PATENTS.

THE UNITED STATES.

ISSUED DECEMBER 14, 1915.

1,163,830 Repeated stress testing machine. J. B. Koppers, Madison, Wis.

ISSUED DECEMBER 28, 1915.

1,166,296 Attachment for fabric tensile strength testers. S. N. Senna, assignor of one-half to C. E. Torrance both of Holyoke, Mass.

THE GERMAN EMPIRE.

PATENT ISSUED (With Date of Validity).

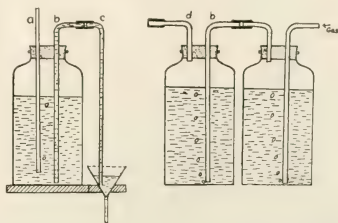
289,543 December 31, 1913. Viscosimeter. New York-Hamburg Rubber Goods Co., Hamburg.

LABORATORY APPARATUS.

A CONSTANT LEVEL FILTER RESERVOIR.

THE constant level filter reservoir here figured possesses the advantage of being easily constructed from materials at hand in every laboratory. The principle involved is old, but its application in the present way is believed to be new.

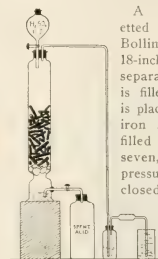
The method of constructing, due to R. R. Turner, is evident from the diagram to the left. Any size of flask or bottle



may be used. The straight tube *a* may be slipped up or down in the stopper, the position of its lower end regulating the level of the liquid in the filter. To start the flow it is only necessary to blow into the tube *a*.

A special convenience of this device lies in the possibility of making precipitations in the same vessel which is later used as a filter reservoir, thus avoiding a transfer. For precipitations by gases the apparatus, as shown at the right, may be arranged by disconnecting tube *c* and substituting *d* for *a*.

SULPHURETTED HYDROGEN GENERATOR.



all times. No acid is wasted; there is no clogging of sulphide.

MODIFIED PIPETTE.

The accompanying sketch shows a very useful form of pipette suggested by Sidney Born. It is made by fusing a stopcock and a piece of bent glass tubing to a pipette. The advantages over the ordinary pipette are:

1. Safety—there is no danger of sucking up acid or dangerous liquids.
2. Ease of manipulation—the stopcock insures tighter closing and greater accuracy than use of a finger.
3. Accuracy—the line of demarcation is level with the eye when using.
4. The pipette can be carried around full without losing any liquid.



Some Molds for Seamless Rubber Goods.

THE desire of manufacturers to produce better and more satisfactory rubber goods has encouraged study of the ways for making seamless articles to replace those formerly turned out with cemented seams.

SHAPING MOLDS FOR SEAMLESS HOT WATER BOTTLES.

The manufacture of seamless blown goods such as hot water bottles offers many interesting problems. These must be intelligently

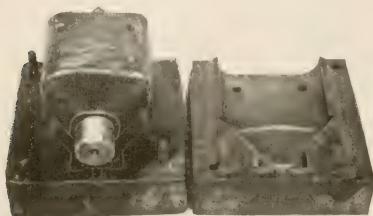


FIG. 1. HOT WATER BOTTLE FUNNEL SHAPING MOLD AND CORE.

considered and accurately solved before the finished product can be placed on the retailers' shelves with any degree of confidence in the stability of the goods.

It would seem that the building up of hot water bottles by hand, formerly the exclusive method of manufacture, would result in a more perfect article than can be produced by standardized mechanical means. This may be so in a few specialized instances. There are many who still stand by the time-honored hand method; but the trend is toward the mold shaped and cured bottle as a more perfect and less costly article. Just how these are made is interesting and instructive.

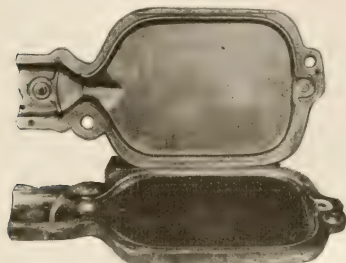


FIG. 2. HOT WATER BOTTLE SHAPING MOLD.

In making one class of bottles, shaping molds are used which are in reality dies that make all the would-be seams, seamless, and at the same time bite off the overflow of surplus rubber from the edges. These dies consist of two sets, one for shaping up the funnel with its threaded socket for the stopper and another which forms the body of the bottle.

Fig. 1 shows the two-part funnel mold and core. In use, a piece of regular sheeted rubber stock, cut approximately to the required size, is laid on the lower mold. A metal reinforcement for the stopper socket is then placed in the constricted end of

the mold and the core with the threaded end, covered completely with a special rubber compound, is slipped over the vertical pins that hold the core in place in the lower mold. Another piece of regular stock cut to suitable size is placed over the upper half and the two parts aligned by dowel pins are then fitted together, with the core between them, and placed under a hydraulic press.

Thus, the seamless funnel and stopper socket with its soft, hard rubber threads and hanging tab are shaped up ready to be attached to the body portion of the bottle. By the way, the stopper is also made of this special stock, but in separate molds that are very like those just described. The metal reinforcement

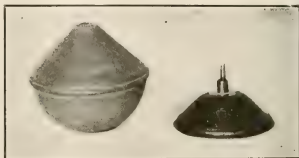


FIG. 3. FLUSH TANK BULB AND METAL CAP.

of the stopper and threads is covered with stock of the same compound as that of the funnel socket.

The next step in the process is to shape up the body portion of the bottle and at the same time attach the funnel which is done by the dies shown in Fig. 2. A sheet of regular stock is laid over the lower mold or die and the funnel core supporting the shaped-up funnel itself is placed in the constricted part of the mold with the threaded portion occupying its proper position in the neck of the bottle mold. The other end of the core extends outside of the molds and is provided with a valve through which air is pumped or "blown" through a hole in the core, into the interior of the bottle.

When the funnel core has been properly arranged in the lower mold another sheet of regular stock is laid on the upper mold

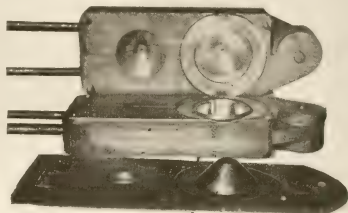


FIG. 4. TANK BULB HINGED SHAPING MOLDS AND CONE PLATE SHAPER.

and pressed in place, after which both molds are placed together and subjected to hydraulic pressure. At the same time air is forced into the bottle to prevent the sides from sticking together. The action of the dies is not only a forming one, shaping and practically welding all joints into a homogeneity, but a shearing one by which the overflow is smoothly and neatly trimmed from the outside edges.

The seamless water bottle is now almost finished; however, there still remains the final curing or vulcanizing process, which

is performed in a different set of molds and is therefore another story.

NOVEL SHAPING MOLD FOR TANK BULBS

In the making of relatively small hollow rubber articles such as bulbs of various sorts and sizes, the component parts are usually cemented together by hand and finished in molds under pressure. If any defects are developed in goods made in this way the weakness is invariably shown by breaks or leaks in the seams.

That inventive thought and marked mechanical skill have been brought to bear correctly on these inherent faults in bulb construction, is forcibly shown in the following description of a new tank bulb and the novel molds for making them.

The old type of flush tank bulb was just an ordinary round hollow rubber ball suspended by a lift rod that was fastened to the ball in any convenient way and was usually inefficient and a constant nuisance. Marked improvements are indisputably possessed by the newest type of tank bulb with the rigid top. In the first place it keeps its shape, for the reason that the upper half is rigid. Then the lower half is half round and made of good quality soft, flexible rubber that insures a positively watertight contact between the bulb and valve seat.

In Fig. 3 will be seen the object in question with the metal reinforcement on the right that imparts rigidity to the upper half of the bulb by being securely vulcanized therein. Then comes the hinged shaping mold—that is shown in the position for filling and emptying by the two following illustrations. Referring first to Fig. 4 will be seen the mold open with the cone plate shaper in front of it. The ball plate shaper is not shown in either illustration as its function will be clearly understood by the description of its use that follows in the context.

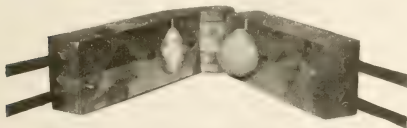


FIG. 5. TANK BULB HINGED SHAPING MOLD OPEN.

A round disk of suitable diameter is cut from a sheet of regular stock and pressed into the lower mold by the cone shaper. The metal cap then follows, and over this another disk of thin rubber is placed and pressed home by the shaper, thus forming the rigid cone shaped half of the bulb.

The lower half or ball part is then covered with a round disk of sheeted stock of suitable thickness which is pressed in place by the ball plate shaper. The two mold parts, which in reality are cutting as well as forming dies, are then placed together—the upper and lower halves being aligned by dowel pins—and the whole subjected to hydraulic pressure. In this way the edges are homogeneously united and the bulb, therefore, is made absolutely seamless, a feature, it would seem, that up to the present time is unique in articles of this description.

Now that this bulb has been satisfactorily shaped there remains still the question of getting it safely out of the mold without injury, as crude rubber stock is soft and easily damaged. This is accomplished by an ingenious construction of the shaping mold, the two halves of which are divided longitudinally and hinged at one end. Thus by the simple process of opening the mold along its vertical plane the completed bulb is easily removed, as can be clearly seen in Fig. 5.

SHAPING MOLDS FOR AEROPLANE INNER TUBES

Just how far the use of dies and molds can be carried in the actual production of inner tubes for automobiles remains to be seen; however, the scheme apparently has practical possibilities capable of further development. The following description and

illustrations relate to the forming and vulcanizing of inner tubes used in the tires of aeroplane wheels.

The molds, or rather dies, are shown in the illustrations, Fig. 6 and Fig. 7. In the former the ring core and mold for shaping up



FIG. 6. AEROPLANE TIRE INNER TUBE SHAPING MOLD AND CORE.

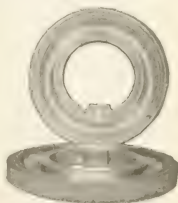


FIG. 7. AEROPLANE TIRE INNER TUBE PRESS MOLD.

one half of the tube is illustrated, the other half mold not being shown. In practice, the sheeted stock is cut in circular or ring form and laid on the lower shaping mold and upon that the circular core is pressed, thereby shaping up one-half of the tube. The other half is formed by another circle of rubber placed as before in the upper mold half and pressed home by the same circular core that was previously used.

Now the two halves of the inner tube are in their respective molds, seen in Fig. 7, and ready to be placed together. Before this is done the air valve must be fixed in its proper position. This is carefully inserted in the cavity provided for it and then the two mold halves, aligned by dowel pins, are placed together and subjected to hydraulic pressure. The result is an absolutely seamless, endless inner tube being formed by pressure and the action of the edges of the upper and lower shaping molds. The complete inner tube is then removed and placed in special vulcanizing molds in which it is cured by heat and pressure.

"SIMPLEX" PIPE JOINT CLAMP.

Pipe joint leaks cost money and often make it necessary to take down the entire line, an expensive procedure when the mill is rushed with orders and working overtime. A handy device that can be quickly applied and one that it is claimed will effectively stop the leak is the "Simplex," which consists of an outside two-part ring, an inside split ring and a square packing ring. To use, the packing ring is first forced against the leaky joint, the inside split ring is next forced against the packing, and the outside ring is bolted around the pipe to prevent slipping. [Yarnall-Waring Co., Philadelphia, Pennsylvania.]

SHALER'S NEWEST REPAIR VULCANIZER.

A new garage electric vulcanizer with capacity for 200 tubes and 12 casings a day differs from the larger steam vulcanizers in that the heat is generated from the city service by connecting with any lamp socket. [C. A. Shaler Co., Waupun, Wisconsin.]

ENGLISH SCHOOLS OF REPAIR VULCANIZING.

The instruction classes held at the City and West End Vulcanizing Schools of Harvey Frost & Co., Limited, London, are intended for those who wish to have actual instruction in the general repair of tires and inner tubes, according to the Harvey Frost process. As the cost of tuition and materials is considerable, a nominal fee is charged, and when the pupil is proficient, he is given a certificate. A certificate can also be obtained by submitting satisfactory repairs executed in accordance with the printed instructions issued by the company. The Harvey Frost Diploma of Merit is further granted by the directors of the schools to those pupils who have shown exceptional ability in making repairs.

PLANTATION SMOKE HOUSE PRACTICE.

THERE is a phenomenon in connection with plantation sheet rubber known as "stretching rusty or resinous," according to B. J. Eaton in "The Tropical Agriculturist" (November, 1915), that brokers frequently attribute to excess resin in the particular rubber. Although this condition probably has no effect on the real quality of the rubber, it affects its market value and should be remedied.

The appearance which is usually produced when the dry rubber is stretched or lightly scratched resembles powdered resin. This phenomenon is due to a sweating or exudation of the serum left in the rubber, which comes to the surface as the sheet of rubber contracts on drying. If this is unable to drain off or if it is not removed it evaporates and leaves a thin film on the surface. This film is not obvious until the rubber is stretched or scratched when it breaks up and on account of the reflection and refraction of light caused by the small particles its appearance is indicated by a deposit resembling powdered resin.

An investigation has been made of surface slime formation on slab rubber. The fresh coagulum from the ordinary pans, which had been only rolled or pressed lightly and contained a large proportion of residual serum, showed a large amount of this deposit. An analysis of the slime after drying completely in a desiccator yielded nitrogen corresponding to a total protein content of over 60 per cent. The remainder was chiefly resin and mineral salts.

The remedy for this fault is simply after machining and making the sheets to wash in one or two changes of water and if necessary to scrub the surface slightly with a stiff brush before placing them in the smoke house.

SMOKE ROOM CONTROL.

Temperature.—The usual method of controlling the temperature in a smoke house is by means of a maximum and minimum thermometer. It is preferable, however, to use an automatic recording instrument to check the work of the operator.

Dampness.—In the case of "sweating" of the rubber in the smoke houses and the deposition of moisture on the interior of the building, it has been found that outside smoking arrangements were employed with a flue leading into the smoke room. As a rule, exterior smoking arrangements are unsatisfactory. The principle of smoking is slow combustion, producing a product rich in antiseptic constituents; consequently to obtain a good smoke the fuel must burn at a comparatively low temperature. Many of the products of this slow combustion, although volatile, are easily condensed, and with an exterior furnace and long flue, these products condense in the flue or near the end entering the smoke room, and the water vapor which passes through condenses in the smoke room itself, on the rubber and on the walls and roof of the room and causes "sweating" or deposition of moisture. Where the fuel is burnt in the smoke house itself in boxes or holes in the ground there is sufficient heat to drive the water vapor out and only the other products are left to diffuse into the rubber.

One factor in connection with smoking which is frequently not realized is that the drying caused by the heat is far more effective as a preventive of mold than the actual smoke products, creosote, etc.

It has been actually stated by scientific workers that where mold appears on smoked sheet the rubber could not have been properly smoked. This is entirely erroneous, as the common mildews will grow most readily on the best smoked sheet if given the proper conditions of moisture.

RUBBER FOOTWEAR PRICE LISTS.

FOR a decade or more, previous to last year, the United States Rubber Co. sent out its new price lists of footwear, its terms to retailers and to jobbers, so that they got into the hands of the wholesale trade all over the country on January 1. Last year, because of the expressed desire of a majority of the wholesale shoe dealers, the announcement was postponed to March 1. This year the company reverted to its previous policy, and the new price lists of footwear made in the several factories of the company were so mailed that they reached the customers January 1.

These new lists are practically the same in detail, as regards prices, as those sent out March 1, 1915, the only changes, which were few, being a variation of five cents or less in individual lines.

As has been the custom in most years the company offers an extra discount of five per cent. for early orders, thus practically making prices that much less than those prevailing during the last half of 1915.

Other rubber footwear manufacturers, as in previous years, were but a few days later than the United States Rubber Co. in publishing prices.

The Hood Rubber Co. in its price list varies in minor details, some lines being slightly higher, others a few cents lower, but on the whole it is much the same as that of the older company.

The Beacon Falls Rubber Shoe Co. will issue a net price list, instead of gross price list with discount, and here also prices are nearly the same.

The B. F. Goodrich Co. issues a wholesale price list of its "Hipress" goods which varies somewhat from the prices of patent pressure process goods manufactured by the United States Rubber Co. In some instances the Akron prices are considerably higher, while in others the variation is only two or three cents, generally higher, but in a few instances lower.

It is evident that when these prices were made it was on a basis of cheaper cost than is possible at this writing. It seems as if these prices must have been determined upon as early as December 1, or thereabouts, when crude rubber was quoted at below the present prices.

The increase in the cost of plantation and wild rubbers would seem to justify an early revision of the price lists, and as all these are "subject to change without notice" the wholesale trade is placing orders to an extent unprecedented for so early in the year. In fact, some manufacturers have already enough orders for early delivery to keep their mills extremely busy for two or three months, and some anxiety is expressed as to the possibility of securing sufficient crude rubber to cover requirements.

THE NEW TENNIS PRICES.

On Friday, January 21, the United States Rubber Co. withdrew its price list of sporting and outing shoes, which had been in operation since September 1. A new list was sent out to reach the wholesale trade by January 24. This list showed an advance in practically all lines of rubber-soled canvas footwear, with the single exception of basket-ball shoes.

The general advance is about five per cent, though some lines, mainly the low-priced ones, show a higher percentage. The Admiral oxfords and bals, which were priced respectively at \$2.25 and \$2.50 net, are now \$2.40 and \$2.65. Other lines show an advance of from two cents to ten cents a pair, most of them being either five or ten-cent advances over September prices.

NEW RESILIENT WHEEL WITH SOLID RUBBER TIRES.

A western concern is manufacturing a new resilient motor truck wheel to be used in connection with solid rubber tires. The elastic mechanism is enclosed in the hub of the wheel, which, otherwise is of standard type and can be quickly attached to any car.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Machinery; Rubber Trade Directory.

Proposed S. A. E. Rubber Standards.

At the meeting of the Society of Automobile Engineers, held January 5 and 6 in the Engineering Societies' Building, New York City, the Standards Committee made many recommendations. Those on insulated wire and cable, rubber hose and clamps, industrial truck tires and solid tire diameters, which are of special interest to rubber manufacturers, are printed below.

It should be noted that these recommendations were favorably received and will be voted on for adoption by a letter ballot of the society which will be polled early in March.

INSULATED WIRE AND CABLE.

The following standards for insulated wire and cable to be used on gasoline cars, were formulated:

CLASS A—RUBBER COMPOUND INSULATED SECONDARY CABLE.

The insulation of this cable shall consist of a vulcanized compound of virgin rubber containing not less than 30 per cent by weight of good dry Upriver Para or Hevea rubber which will stand the following tests:

A test-specimen of rubber compound taken from a cable having a length of not less than 6 inches shall have marks placed upon it two inches apart. The sample shall then be stretched at the rate of 12 inches per minute until these marks are 6 inches apart; the test-specimen shall then be released within 5 seconds and a measurement taken one minute thereafter, when the distance between these marks shall then not exceed 2½ inches. The test-specimen shall then be stretched until marks are 9 inches apart before rupture. This test shall be made at a temperature of not less than 10 degrees C. or 50 degrees F.

The ultimate tensile strength of the rubber compound shall not be less than 1,000 pounds per square inch calculated upon the original cross-section of test-specimens before stretching. This test shall be made at a temperature of not less than 10 degrees C. (50 degrees F.).

Each specimen of rubber insulated cable shall successfully withstand a voltage test of 12,000 A. C. for 5 minutes after 12 hours submersion in water and while still immersed.

After the voltage test, the cable while still immersed shall have an insulation resistance of 2,500 megohms per mile at 15.50 degrees C. (60 degrees F.) after one minute electrification. These two tests shall be made in accordance with the standard rules of the A. I. E. E.

Any one-foot sample of this rubber insulated cable must show a dielectric strength sufficient to resist through 5 minutes the application of 20,000 volts A. C. This test shall be made as specified in the National Electric Code.

The following aging test should be made to determine the life of the cable: Take a length of cable, preferably 5 feet, remove insulation from both ends, solder one end of cable to the end of a steel rod of same diameter as outside diameter of cable, wrap the cable tightly around this rod and solder the other end of cable to the rod so that it will retain its tightly wrapped condition. Leave exposed in this condition to the elements. If cable is not properly compounded and properly vulcanized, deterioration effects, such as hardening, becoming brittle and cracking will begin to be apparent in from one to three months.

Secondary cable is to be made in two sizes as shown by Table I. The overall diameters are 7 mm. and 9 mm. respectively for plain rubber insulation. If a varnished cotton braid is desired the same dimensions are to be used with the addition of glazed cotton braid approximately 1/64 inch thick, making the overall diameters 5/16 inch and ¾ inch respectively. The braid is to be treated with at least two coats of insulating varnish dried separately.

TABLE I—SECONDARY CABLE.

Nominal Size	No. of Wires	Diam. of Wires (Circular Mil.)	Diam. over Wires (Circular Mil.)	Rubber (Max.)	Rubber (Min.)
26	37	.010	2600	.065	.100
32	37	.010	3700	.072	.125

CLASS B—RUBBER COMPOUND INSULATED PRIMARY CABLE.

The insulation of this cable shall consist of a rubber compound and two thicknesses of fabric. The compound is to be evenly applied in thickness as specified in Table II, and must conform to the physical and electrical requirements of the National Electric Code (latest edition).

The rubber compound to be covered first either with an overlapping strip of varnished cambric .008 to .010 inch thick, or a cotton braid at least 1/64 inch thick, so saturated as to make it oil and moisture-proof.

The first fabric is to be covered with an outer braid of strong protective character and at least 1/64 inch thick, preferably glazed and treated with at least two coats of insulating varnish dried separately.

The completed cable shall be capable of withstanding for one minute one thousand volts A. C. applied between the copper conductor and a metal foil wrapped around the outside of insulation. The frequency of the test circuit shall be in accordance with the standard rules of the A. I. E. E.

TABLE II—RUBBER COMPOUND INSULATED PRIMARY CABLE.

Cable Size	No. of Wires	Diam. of Wires	No. of Strands	Carrying Capacity (Amps.)	Diam. over Braid (Inches)	Thickness of Rubber (Inches)
No. 14	41	.01093	1	4,099	.380	.12
No. 12	49	.01114	1	4,914	.380	.12
No. 10	49	.0142	3	4,914	.380	.12
No. 8	49	.0142	3	4,914	.380	.12
No. 6	133	.0254	19	85,466	.60	1/16"
No. 4	133	.0254	19	107,243	.60	1/16"
No. 00	133	.032	19	135,926	.60	1/16"

Stranding—Number 14 to be bunched; numbers 12 and 10 to be bunched or rope lay; numbers 2, 1, 0, 00 to be rope lay.

RUBBER HOSE AND CLAMPS.

Sizes for hose and hose-clamps are submitted (see table) for standardization. They cover hose in all sizes commonly used for water connections and tire-pumps. There is considerable variation in thickness of hose of the same ply, but generally 1/32 inch of hose thickness is allowed for the inside rubber lining, 1/32 inch for the outside, and 1/16 inch for each ply of fabric. The table was prepared accordingly with the addition of the tolerance limits.

SIZES OF HOSE CLAMPS AND HOSE-FITTINGS.

Outside diameter of hose and extended inside diameter of clamps.

Inside Hose Diameter	Single-ply	Two-ply	Three-ply	Four-ply	Length of Hose for Lap of Hose
3/16	7/16	1 1/16	1 1/16	1 1/16	1
5/16	9/16	1 1/16	1 1/16	1 1/16	1
3/8	1 1/8	1 1/8	1 1/8	1 1/8	1
7/8	1 1/8	1 1/8	1 1/8	1 1/8	1
1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1
1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1
1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1
1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1
2	2	2	2	2	1
2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	1
2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	1
2 3/4	2 3/4	2 3/4	2 3/4	2 3/4	1
3	3	3	3	3	1

1. Limit on inside diameter of hose. 2. Limit on outside diameter of hose not measured at lap) is 1/64. All dimensions in inches.

INDUSTRIAL TRUCK TIRES.

It is recommended that the standard nominal diameters of industrial truck wheels shall be 10, 16, 20, 22 and 27 inches. On the data sheet with the wheel diameters shall be printed a footnote indicating the present tire sections recommended by the Association of Railway Electrical Engineers.

SOLID TIRE DIAMETERS.

It is recommended that the 32-inch diameter be dropped from the standard list of truck wheel diameters. This is done because it is found that commercial cars with wheels as small as 32 inches are almost always fitted with pneumatic tires, and 32-inch tires form a very small percentage of the total output of solid tires.

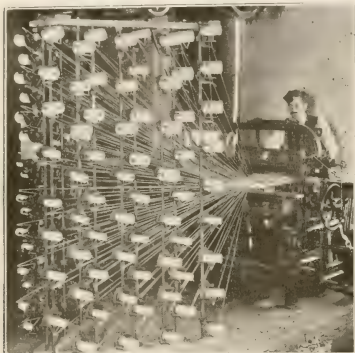
The 34-inch tire is recommended for inclusion in the list of sizes. There has been considerable demand for the inclusion of this size in the S. A. E. standards, and the recent circulation of a document signed by tire and wheel makers has served to draw out comment and results in this recommendation.

The data sheet is to be rearranged to indicate that only tires of 34, 36 and 40 inches are S. A. E. Standard, although data on the other sizes is to be printed as a guide for tires of other than standard sizes.

Continuous Process Tire Manufacture.

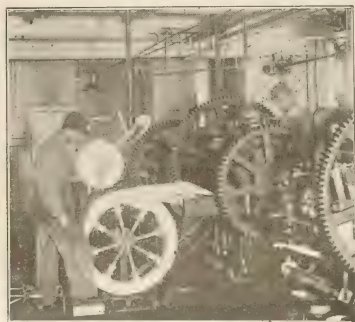
THE two things that all of the manufacturers of motor tires have been working toward for the past five years have been, first, an ideal fabric for the carcass and, second, a continuous mechanical process in the making and curing.

In the attempt to produce the strongest and most durable fabric



LOOM FOR WEAVING FABRIC EXACT SHAPE AND WIDTH FOR TIRE CARCASS.

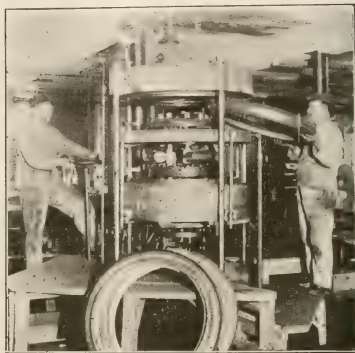
there have been evolved two distinct types, the woven fabric and the cord fabric. Of the former hundreds of different weaves were tried before the present standard weave was adopted. In use this fabric is frictioned, cut into strips on a bias cutter and the strips pasted end to end and wound into rolls ready to be applied to the tire core. The cord fabric is, of course, built up by special cord laying machines.



BUILDING THE TIRE CARCASS WITH FABRIC DIRECT FROM THE FRICTION CALENDER.

While many tire making machines have been invented and scores of others are in use as accessories to tire manufacture, only one has made the loom and the calender a part of the continuous process. That one is the Doughty process, owned by

the Doughty Tire Co., Providence, Rhode Island. When the Doughty patents were issued some few months ago they were described in this publication from the patent office drawings. Now we are able to show views of the most important machines in operation.



STEAM HEATED, HYDRAULIC TIRE PRESS MOLD WITH ELECTRICALLY HEATED EXPANSIBLE CORE.

The process begins with the weaving of the fabric in bands, the exact width of the tire carcass. The weave is so arranged that the strip comes from the loom shaped as it will be when made up into a tire.

This strip of fabric is next passed through a calender, the rolls of which are shaped to it, where it is frictioned. Directly from the calender it is wound hot upon the tire core.

The carcass next goes to the tire press mold where, with an expansible electrically heated core on the inside and the usual



SPECIMEN OF THE DOUGHTY FABRIC.

steam heat in the platens, it is cured in 15 to 20 minutes. The time required for the whole process is about 30 minutes.

So far tests of tires made show unusual mileage, while the owners of the process claim that they save 50 per cent in time and labor over existing processes.

These machines are now assembled in Providence. So far the company have not attempted to manufacture tires for general use, as the plan is to lease the machinery on a small royalty basis.

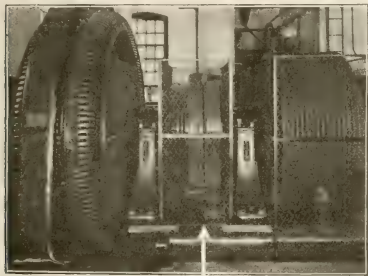
New Machines and Appliances.

SAFETY STOP AND MAGNETIC CLUTCH-BRAKE FOR MILLS.

THIS is a safety stop device for use in rubber mills where a quick and reliable means of throwing off the driving power and applying a powerful brake to stop the mill line is necessary to prevent injury or loss of life of operators who may be caught in the mill rolls or gearing.

A highly perfected safety device that has been subjected to most rigorous tests in millroom requirements is illustrated herewith. The equipment consists of a synchronous motor drive mounted on a common sub-base with a driven rope sheave, the magnetic clutch-brake furnishing the connection between the motor and the rope sheave. The motor is rated at 650 horsepower, runs at 240 R. P. M. and under normal conditions carries practically full load when the mill line is operating.

Throughout the millroom safety switches are mounted on the frame of each mill and trip rods are located above the rolls



within easy reach from each side of the mill. The safety switches are arranged in series electrically so that the magnetic clutch will be disengaged and the brake simultaneously applied when this safety rod is tripped in case of an accident. To start the machinery again with its heavy load a single push button is provided in the motor room which engages the clutch energized by an automatic rheostat in such a way that the load is picked up gradually. [The Cutler-Hammer Manufacturing Co., Milwaukee, Wisconsin.]

"JUMBO" STEAM JACKETED MIXER.

The improvement during recent years in machines for building tire casings has been so radical that manufacturers of machinery and appliances have been extremely busy in meeting the present demands for improved machinery. Gammeter's galvanized steel tire machine drum was specially designed to meet the urgent requirements of modern tire building. It is used for handling the fabric or rubber stock from which tire casings



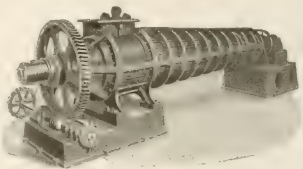
are made. In construction it is strong, rigid, light and durable. It is 8 inches in diameter and 16 inches long and will fit any size mandrel. [W. F. Gammeter, Cadiz, Ohio.]

SCREW PRESS AND ROTARY DRYER FOR RUBBER WASTE.

In reclaiming, the process of drying washed rubber waste has been greatly facilitated and production cost materially reduced

by the automatic continuous screw press and direct steam heated air dryer shown in the accompanying illustrations. As the machines are installed together the process therefore is a continuous one.

The American screw press consists of a horizontal tapered screw built up on a hollow perforated shaft arranged to allow the admitting of steam to the material if desired. The screw fits closely inside a similarly tapered, slatted curb and rotates. The wet waste is delivered from the washers to



the feed hopper of the press where the material is mechanically measured and forced into the straight, purely conveyor part of the screw. This carries the waste into the tapered curb, where it is slowly and positively pressed, forcing out the liquids. The press is fitted at the discharge end with an adjustable cone arrangement by which the desired pressure is produced in the press.

The waste after passing through the press is delivered to the hopper of the rotary dryer and comes in contact with the air, heated by being blown over steam coils in the heater. The waste falls to the bottom of the dryer, is caught up and lifted to almost the highest point of rotation

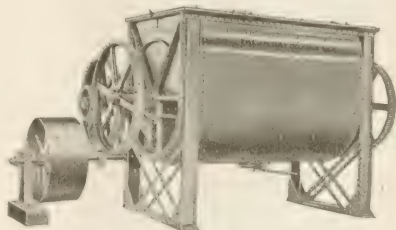


and is then showered through the hot air. This cycle of operations is repeated until the material, in a dried condition, is discharged from the lower end of the dryer. It is claimed that by this method waste can be dried in less than half an hour. [American Process Co., New York City.]

"JUMBO" STEAM JACKETED MIXER.

This mixer and churn is made in sizes of from 1 to 25 barrels capacity, and with or without a steam jacket.

Designed especially for rubber manufacturers and to withstand



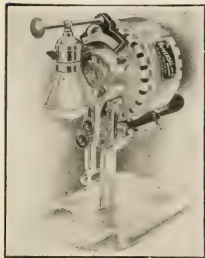
hard usage, the "Jumbo" mixer is of unusually heavy construction. It is a machine that can be adapted for many uses as, for mixing, heating and drying powdered materials, for mixing pastes of all kinds, and for dampening preparations under heat. This

type of machine is made with special agitators adapted to the various materials to be mixed, including the rubber cements used by manufacturers of rubber goods.

The gearing on the mixer is made to suit any class of material, from the lightest liquid pastes to the heaviest cements that can be drawn off through a 6 or 8-inch opening. As shown in the illustration the mixer is provided with a tight and a loose pulley for belt drive. [J. H. Day & Co., Cincinnati, Ohio.]

ELECTRIC CLOTH CUTTER.

For cutting up many plies of materials such as cotton goods used in the manufacture of rubber clothing, the power driven cloth cutter is a necessary and indispensable part of the factory equipment.



The vertical blade machine shown in the illustration possesses many excellent features in construction and is claimed to have successfully withstood the most rigorous tests in many rubber clothing factories. The foot or standard which supports the machine is made interchangeable to any desired size; that is, the machine can be equipped with a very narrow standard for cutting sharp curves, as in

collars, cuffs, neckbands, belts, pocket flaps, etc.

The vertical knife is reciprocated by a powerful air cooled motor from either direct or alternating current, and the weight is so placed that perfect balance and ease of manipulation is obtained. The blade can be readily removed at the front of the machine and the presser foot is easily adjusted to the work, requiring no readjustment when sharpening the blades.

A novel feature is the shaded electric light that illuminates the work, thereby greatly aiding the operator in accurate cutting. The switch, of an approved type, is controlled from the handle, and the base is provided with ball bearing rollers that reduce the friction in passing over the goods to a minimum, thereby insuring facility and accuracy in operation.

The Universal cutter is made in sizes that will cut lays from 3 to 6 inches high and is guaranteed by the makers against mechanical or electrical imperfection for one year. [Universal Cutter Co., St. Louis, Missouri.]

MACHINERY PATENTS.

DEVINE'S SPREADING MACHINE.

IN this machine for proofing fabrics the spreading and drying operations and the recovery of the volatile solvents are conducted in a closed chamber under a partial vacuum.

Referring to the diagram, a longitudinal cross-section view, *A* represents the vacuum drying chamber, *B* openings for the pipes leading to the condenser and air pump, *C* delivery drum, *D* receiving drum, *E* a removable front plate for introducing the fabric and *F* a back plate for removing the roll of proofed fabric. The other main parts include the feed hopper *G*, the spreading knife *H*, the heating table *J* and the fabric *K*.

In operation the coating material flows from the feed hopper upon the fabric and is spread as it passes under the

knife or doctor. This coating material is dried as the coated fabric passes through the drying chamber and the vapors of the volatile solvent released in this drying operation are drawn off by a pump and recovered in a condenser. As this operation is carried on in a vacuum, the solvent is evaporated at a comparatively low temperature and the drying is effected quickly and thoroughly, preventing the escape of the vaporized solvent. [J. P. Devine, United States patent No. 1,164,174.]

HEATED FORM FOR DIPPED GOODS.

To obviate the necessity of drying by exposing the dipped form to the air after each dipping operation, Williams has invented a form, heated on the interior, to cause the solvent to evaporate rapidly from the coat of material on the form.

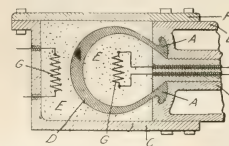
The present invention provides for uniform heat throughout the form and a reduction of the time necessary for drying.

The drawing shows a hollow glove form *A* made of bronze. At the wrist portion is a closure *B* with an opening *C*, through which is poured the volatile liquid *D*. Tube *E* is threaded at its open end and heat is transmitted to the liquid by this tube and the inner pipe *F*, which is connected to the supply pipe *G*.

In practice the form is inverted and filled about two-thirds full with liquid, which is preferably gasoline. When still in this position, the form is heated in any suitable manner until the liquid boils freely and vapor passes off through the opening. The opening is sealed while the liquid is still boiling so that only the vapor and the liquid itself exist inside the form. Then the form is attached to the pipe from the heating source and a uniform heat throughout will result and be maintained during the dipping operation by the washing back and forth of the liquid. [Carl S. Williams, assignor to Revere Rubber Co., United States patent No. 1,163,053.]

ELECTRIC TIRE MOLD.

By the use of a mobile material as soapstone or sand instead of the tire core and the usual two-part mold or cloth wrapping, Price claims to overcome many of the present difficulties in curing tires. To accurately shape beads it is



necessary that they should be clamped and to prevent sagging of the tread it should be supported, especially during the initial vulcanizing heat.

Referring to the drawing, the beads *A* are clamped in the

plates *B*, to the lower one of which is attached a box-like structure *C* inclosing the tread *D*. The soapstone, sand or mica *E* surrounds and incloses the tread completely as shown. If pressure is to be exerted in the box, cover *F* is bolted down and the shoe thus arranged is ready for vulcanization which is accomplished by means of the electric resistance coils *G* and steam or electric coils in plates *B*.

In a modification of the above a hollow metal core is used instead of the soapstone or like substance, in which either steam or electric coils are the vulcanization agents. [R. B. Price, assignor to Rubber Regenerating Co., United States patent No. 1,162,397.]

The Editor's Book Table.

PHYSIOLOGICAL PRINCIPLES FOR DETERMINING THE VALUE of the Various Rubber Tapping Methods. Founded on some experiments made on *Hevea Brasiliensis*. By Professor Dr. Hans Fitting, "The Times of Ceylon" Co., Limited, London, England. [Paper covers, 51 pages, with four diagrams. Price, 1s. and R 1.]

THE rubber planter is interested not only in bringing his property to a state of commercial productiveness, but is equally concerned in prolonging the period of its return upon his outlays. In other words, he wants to get as much as he can and as long as he can out of his trees through proper handling.

Vitally involved in this problem is the question of how best to tap them. This subject has been treated suggestively by Professor Dr. Hans Fitting, one of Germany's foremost physiological botanists. The learned savant studied the subject at close range in the Malay States and in Java, and as a result of many experiments came to certain definite and valuable conclusions. These he put forth in an admirable brochure, which for the first time is now rendered in English.

PRACTICAL EXPORTING. A HANDBOOK FOR MANUFACTURERS AND MERCHANTS. By B. Olney Hough, The Johnston Export Publishing Co., New York City, 1915. 8vo, 632 pages, with 39 inserts of forms. [Flexible leather, \$5; cloth, \$4.]

For the manufacturer about to branch out into export trade, this book will prove of inestimable value, while the firm with an established department will find it a compendium of useful information.

The book has been arranged with the object of making possible quick and direct reference to any special problem. Each phase of the business is treated in a separate chapter, with frequent side heads. The volume opens with a brief summary of the growth of American export trade and a description of the immensity of the world market that lies at our gates.

The manufacturer hesitating to enter this market will find ample encouragement and guidance in the exhaustive presentation of the subject. He will learn of the facilities for export trade, of the customs and methods that are advantageous. The basic rules for exporting are given so that misunderstandings of the export problems are explained and mistaken ideas of credit terms corrected. The relative values of foreign markets are discussed, as are the requirements concerning patents and trade-marks.

Emphasis is laid on the specialized attention that the export business requires, even if a separate department may be deemed unnecessary and suggestions are given concerning proper organization and conduct. The author, whose practical export experience has extended over 20 years, goes into detailed description of the machinery for developing export demand and trading, which consists of correspondence, traveling salesmen, commission houses and advertising.

He especially urges the consideration due export orders in the matter of prompt attention. There is an interesting presentation of the methods of making price quotations, and a description of foreign ratings. Much detailed information is given concerning the preparation of merchandise for shipment, calculation of export weights and measurements, the addressing of packages and the rendering of invoices. Methods of marketing shipments are described and incidental ocean freight rates, consular and other formalities are explained, together with marine insurance.

The book closes with an excellent presentation of the methods of financing foreign business and systems of credits and collections. The text is supplemented by 39 inserts, which are reproductions of documents in actual use, comprising a compilation of the papers and forms usually involved in every step of an export transaction, from the receiving of the order to the final payment.

A HANDBOOK OF WEAVES. BY G. H. OELSNER, DIRECTOR OF the Weaving School at Werdau. Translated and revised by Samuel S. Dale, The Macmillan Company, New York, 1915. [8vo, 397 pages, 1,875 illustrations, including a supplement, "Analysis of Weaves and Fabrics," by the translator.]

The student of textiles and in fact all who are interested in the production of fabrics should take advantage of the technical knowledge this volume affords. The book is confined practically to the complicated art of weave construction which is described in clear, concise language that can readily be understood. The illustrations are particularly clear and graphically convey to the reader a complete understanding of the various weaves used in fabric construction.

The book begins with the very important subject of drawing-in drafts; that is, drawing the warp yarn into the harness, an operation upon which depends the successful production of the weave pattern. Then follow explanations of the weave draft or plan for interlacing the warp and filling. The twist of the yarn and the set of the threads are explained graphically, followed by clear-cut descriptions of all sorts of weaves—plain, twill, satin rib and crepe.

Back warp fabrics are weaves, with an extra set of warp threads on the back. While single, double and tubular fabrics are familiar to the layman by name only, all of these many fabric weaves are made clear by orderly context and illustration. Each succeeding chapter carries the interested reader along through the labyrinth of special weaves and fabrics and finally closes with a description of how to determine the weave and fabric construction of a certain woven cloth.

NEW TRADE PUBLICATIONS.

NEW CATALOGS OF THE UNITED STATES RUBBER CO.

THE new footwear catalogs of the various factories of the United States Rubber Co. were issued so as to reach the dealers on January 1, as has been the custom.

This year the number of booklets has been materially decreased, due to the fact that the various main catalogs contain on the last pages of each book the net price lists. These principal catalogs, each measuring $4\frac{1}{2} \times 8\frac{1}{2}$ inches, are attractively printed on heavy coated paper and illustrated with half-tone cuts that faithfully reproduce the extensive lines of goods shown. Each book has a distinctive cover design, printed in attractive colors. These nine catalogs used to describe footwear bear the names of the following companies: American, Banigan, Boston, Candee, Goodyear Glove, Lycoming, Meyer & Jersey, Wales-Goodyear, and Woonsocket.

In addition to these United States Rubber Co. has issued the following literature in booklets $3\frac{1}{4} \times 6$ inches in size: 24-page booklet describing miscellaneous goods; 16-page gross price list of miscellaneous goods; 16-page catalog and price list of "Empire" brand rubber boots and shoes; 24-page net price list of "Unika" brand rubbers; 12-page catalog and price list of the Everstick rubbers; 16-page catalog and net price list of Wales-Goodyear patent pressure process goods and United States Rubber Co.'s "Naugasole" goods; the unlisted list; leaflets of bathing and sporting shoes, and the net price list of the Medford Woolen Manufacturing Co.

* * *

A new catalog issued by the Canadian Consolidated Rubber Co., Limited, Montreal, Canada, which has 28 service branches throughout the Dominion, is an attractive book of 90 pages, well printed on good quality coated paper, in black and colors. Many of the illustrations, which are particularly good, show the articles in natural colors, greatly adding to the pleasing appearance of the catalog, in which the titles and descriptions are printed in both English and French.

The B. F. Goodrich Co., Akron, Ohio, has sent out its wholesale price list of "Hiress" rubber footwear, a neatly printed booklet showing in appropriate colors the company's brown and white rubber specialties with the red line round the top. Felt boots and socks are also included in the price list.

* * *

The Apsley Rubber Co., Hudson, Massachusetts, has sent out a small booklet, dated January 1, giving net prices of its Granger line of red and white boots and lumbermen's, made by special process.

* * *

"Echoes from the Convention," is a little 12-page booklet containing the address given by Colonel Samuel P. Colt, president of the United States Rubber Co., to the footwear salesmen of that company at a convention held in Boston late in December. In his address Colonel Colt stated that the business of the world is to be carried on by great corporations which, because of the magnitude of business, can employ men of the highest order. There are many concerns, managed on most magnificent principles, that are building up our country and have enabled us to compete with the world in the manufacture of rubber goods.

CALENDARS AND SOUVENIRS.

IN addition to the calendars and souvenirs that were noted in the January issue of THE INDIA RUBBER WORLD as having been distributed to the rubber trade at the holiday season, attention may be called to the following:

An attractive 9 x 13 inches, delicately colored sepia print, depicting an old music master at the piano with his pupil, a quaintly costumed little girl, is mounted on a large white background which bears a calendar pad and, in modest lettering, the name of the Adamson Machine Co., manufacturer of rubber working machinery, Akron, Ohio.

A calendar in which each month is featured and the previous and coming month are shown less prominently, thus affording a convenient business reference, was distributed by George F. Lufbery, Jr., manufacturer of chemicals, Elizabeth, New Jersey.

With a separate leaf for each day of the year and with a date printed in 3-inch prominent figures, the pad being securely attached to a dark blue card which may be hung on the wall, the calendar of the Stamford Rubber Supply Co., manufacturer of rubber substitutes, Stamford, Connecticut, forms a useful adjunct to a business office.

Hamilton E. Bast, manager of the Hamilton Rubber Manufacturing Co. and the Acme Belting Co., Chicago, Illinois, has distributed a pleasing art calendar with a sepia print of "The Lass That Loves a Sailor."

The Hygienic Rubber Works, manufacturer of dental vulcanite, Muskegon, Michigan, has sent its friends an attractive art calendar.

Among the most useful calendars of the season is the desk memorandum or engagement pad that has been distributed by the Electric Hose & Rubber Co., manufacturer of rubber hose, Wilmington, Delaware.

Keystone tubes, boots and patches are attractively advertised by the pictorial calendar distributed to the trade by the Keystone Rubber Manufacturing Co., Erie, Pennsylvania.

A nicely made diary for 1916, containing colored maps and much interesting and useful information, has been issued by John Royle & Sons, manufacturers of looms, tubing and insulating machines, and strainers, Paterson, New Jersey.

Stanley Doggett, dealer in chemicals, New York City, distributed a large office calendar, with a leaf for each month on which the preceding and following months are conveniently displayed in lighter type.

A brass holder for scratch paper for desk use was distributed

with the compliments of the Katzenbach & Bullock Co., importer and dealer in chemicals, Trenton, New Jersey.

A large wall calendar illustrating the modern Rip Van Winkle has been sent to the trade by the R. J. Caldwell Co., Inc., dealer in tire fabrics, New York City.

Perhaps no more acceptable New Year's souvenir was distributed than the combination brass calendar and clip mounted on an attractive base that was sent to friends by Ernest Jacoby, dealer in crude rubber and compounding ingredients, Boston, Massachusetts.

RUBBER TRADE INQUIRIES.

[148] An inquiry has been received from South Africa for masticated rubber and rubber compounds for manufacturing purposes.

* * *

[149] If a manufacturer of machines for inflating toy balloons will send his name to this office we will be pleased to forward it.

* * *

[150] Where can aluminum forms for making nipples by dipping be obtained?

* * *

[151] An inquiry is received for a tough, rubber-like composition not affected by heat or cold, and with some resiliency.

* * *

[152] A correspondent seeks a rubber manufacturer who will make about 10,000 rubber dolls, according to a given design.

* * *

[153] An inquirer desires the names and addresses of manufacturers of rubber specialties.

* * *

[154] An inquiry has been received for Pontianak resin.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A commission agent in France desires to purchase 20,000 bottle-shaped tin cans with screw stoppers and rubber washers. Report No. 19,647.

An English firm is in the market for large quantities of superior quality black rubber bellows. Report No. 19,650.

A business man in Peru desires to purchase a repairing outfit for vulcanizing tires. Report No. 19,722.

An agent in Switzerland desires to represent American manufacturers of sanitary rubber goods and other articles. Report No. 19,808.

A firm in South Africa desires to secure agencies from American manufacturers of waterproof bathing caps and other articles of wearing apparel. Report No. 19,822.

A Danish firm wishes to represent manufacturers of tires and general accessories. Report No. 19,865.

Communication with American manufacturers of rubber stamps, fountain pens, etc., is desired by a firm in India. Report No. 19,867.

A Central American firm desires catalogs and samples from American manufacturers of rubber belting and other articles. Report No. 19,869.

Quotations from American exporters of rubber-covered wires are desired by a firm in India. Report No. 19,885.

Automobile dealers in an insular possession desire to represent American manufacturers of automobile tires. Report No. 19,892.

Commercial relations are desired by a firm in Spain with American manufacturers of hard rubber irrigators. Report No. 19,900.

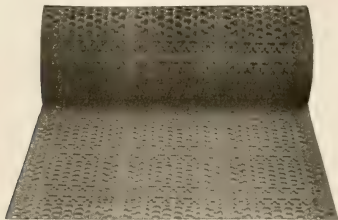
A surgeon in Spain would like to purchase medical rubber goods from American manufacturers. Report No. 19,911.

A firm in Spain desires to import waterproof cloth in wholesale quantities for making clothing. Report No. 19,919.

New Goods and Specialties.

PERFORATED MATTING IN ROLLS.

RUBBER matting, as a substitute for the old-style fiber matting, or carpet runners, have grown steadily in favor as a floor covering, especially for use in public buildings. Its wearing qualities are excellent, and it is pleasant to walk upon, being soft and yielding to the step. Easily cleaned, and non-absorbent, it is especially well suited for use in damp or wet places. Perforated rubber matting has been used for years, with



uniform success, but a new development in this line is shown herewith, in the form of rolls of matting, from which mats can be cut in any length desired, the widths manufactured ranging from 18 to 36 inches. This form of matting is convenient for dealers, since they do not need to keep a supply of the various sizes, and can accommodate their customers with a greater latitude in size than the cut mats allowed. [The Mechanical Rubber Co., Cleveland, Ohio.]

CONVENIENCES FOR DISH WASHING.

Dish washing is evidently becoming one of the fine arts. The mop superseded the cloth, to the decided benefit of women's hands, and now there is a device which not only does away with the necessity of immersing the hands in the water, but supplies clean water. As shown in the illustration, the cotton mop is attached by two small screws to the hexagonal-shaped handle connected to the rubber tube, thus allowing the mop to be taken off and renewed. The rubber tube is fastened to either the hot or cold water faucet, carrying the water through the mop and affording a constant flow of clean water, regulated to any volume.

In another similar brush there is a self-soaping device, the water flowing down the rubber tube and driving through a soap box before reaching the bristle brush used for dish washing. [Fuller Brush Co., Hartford, Connecticut.]

THE AQUA-PHONE.

This name might in justice be changed to the Aqua-Detector-Phone, if a descriptive title be desired, for the instrument is designed first to detect escaping water and then to telephone the information to the operator. In appearance and size it is an exact counterpart of the standard telephone receiver. The outer part is made of hard rubber, and it is composed entirely of this material and aluminum. It is used to detect leaks in water pipes, and its operation is simple. A metal rod is driven into the ground,

or the key placed in position on a street surface valve, as the case may be; the point of the Aqua-Phone is touched to the rod, when, if there is a leak nearby, the sound of escaping water can be heard through the receiver. It may also be used in factories and other places where the continued wastage of metered water is costly. [Aqua-Phone Co., Cincinnati, Ohio.]

THE "SANITARY" FLEXIBLE RUBBER FLY SWATTER.

Many different materials, wire perhaps being the most general, have been utilized in destroyers of that persistent enemy of peace and good temper, the fly. Rubber as used in the "Sanitary"



fly swatter, illustrated herewith, has many advantages over other materials, as it will not rust, no matter how salty the atmosphere, or injure the furniture. The soft, flexible rubber adapts itself to any angle, conforms to the shape of the surface against which it is struck and can be washed and kept perfectly clean. This fly swatter is supplied with a straight or turned handle as desired. [Standard Vending Machine Co., Hazleton, Pennsylvania.]

THREE NEW RAINCOAT MODELS.

The latest models of raincoats for men and women show style and individuality as created by the well-known makers of "Kenreign" garments, combining modish cut with high quality.

These raincoats are made in single and double texture rubberized fabrics, proofed by the "Kenreign" process. The single texture goods have a fancy art design proofing of pure Para rubber on the back of the material which gives a very pleasing effect. They are made in various colors, light and dark tan, however, being the most popular.



The style and quality of these coats are such that they are actually worn as much in fair, as in rainy weather. As an automobile garment they are unsurpassed, being dustproof as well as rainproof, and can easily be slipped on over the usual cloth, affording a comfortable and highly presentable protection. [C. Kenyon Co., Brooklyn, New York.]

A NOVEL SHAVING BRUSH.

For the traveler, to whom economy of space and convenient availability of shaving materials are necessary, this all rubber device has been invented. On the left in the illustration is the brush holder that also contains the soap and which fits into the massage brush shown on the right. Sufficient hot

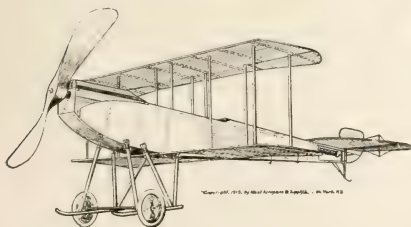


water for producing a foamy lather is contained in the holder shown in the center of the picture. When the sartorial function is finished the two active parts of the brush can be compactly fitted into one another and finally into the holder. [Robert Webb, Brooklyn, New York.]

MODEL AEROPLANES DRIVEN BY RUBBER STRANDS.

Model aeroplanes are now made that are perfect reproductions of their larger prototype and on an exact scale reduction. The three-foot model appears to be the most popular and is furnished in the various types that are now familiar to everyone. A popular model is that of the famous monoplane, Bleriot XI, which made the first successful flight across the English channel. Another is a perfect replica of the famous Taube monoplane used by the German and Austrian armies.

Our illustration shows the Curtiss military biplane tractor that



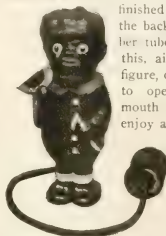
is used by the United States government, and is rapidly replacing the pusher type of aeroplane. An excellent flyer is the three-foot model Curtiss flying boat that, owing to its waterproof and sturdy construction, makes a splendid motor boat. The Wright biplane and the Curtiss convertible hydro-aeroplane are supplied in the three-foot model sizes and are very popular types, particularly with the older devotees of the game. There are also gliders, speed-planes, aero-tops and various other flying toys that are primarily designed for amusement, but doubtless could all be used effectively for demonstrating the principles of aviation.

The motive power of these miniature flying machines is developed by rubber strands that are twisted or wound up like a spring and which, when released, drive the propeller shaft for a period of time, depending on the length and thickness of these rubber strands. As shown in the illustration rubber tired wheels are

also used and stream-line disc wheels add to the apparent realism of these clever mechanical toys. [Ideal Aeroplane and Supply Co., New York City.]

A JAPANESE NOVELTY.

The new Japanese novelty shown in the illustration is the figure of a "danky" made of a papier-mâché-like composition and finished in natural and attractive colors. To the back of the figure is attached a small rubber tube and a cylindrical bulb. By pressing this, air is forced to the figure, causing the "danky" to open and close his mouth as though about to enjoy a luscious bite from the realistic slice of watermelon held in his right hand. [A. A. Vantine & Co., Inc., New York City.]



A RUBBER DOLL THAT TALKS.

One of the unique novelties of the season, shown in the illustration, is a rubber doll, with a semblance of cozy winter costuming in the shape of mittens and a high, pointed hood tied under the chin. The feature that children most appreciate in this toy is that when the head is squeezed by a pressure of the hand, the doll responds by uttering sounds in a squeaky voice.

PHILLIPS' "MILITARY" SOLES AND HEELS.

A timely innovation in rubber soles and heels designed with especial regard to the needs of military service consists of thin rubber plates, provided with raised studs that are attached



to ordinary soles and heels, as shown in the accompanying illustration. The manufacturer claims that the rubber used in these plates is six times more durable than leather and that they not only keep the feet dry, no matter what the weather, but by their gripping qualities and the smoothness they impart to the tread greatly lessen the fatigue of long marches. This form of heel and sole protection is equally adapted for athletic sports and country wear. [Phillips' Patents, Limited, London, England.]

POCKET SCREW DRIVER WITH RUBBER HANDLE.

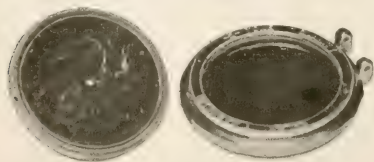
In this compact tool there are four blades of different widths, any of which may be readily taken from the telescope handle as required and inserted in the end where it locks automatically and is firmly held for use. The handle is covered with hard rubber for insulation from electrical currents, and its ribbed surface insures a firm grip for the hand. The blades may all be kept in the handle, a spring pressure preventing them from rattling when carried in the pocket or being lost when the cap is off. [The L. S. Starett Co., Athol, Massachusetts.]



The tendency of the end of the suction tube of a bulb syringe to close by adhering in contact with a smooth surface has been effectively obviated in this type of syringe by vulcanizing to the inlet a flat loop or ring of rubber of the same quality as that of the tube. [Mechanical Rubber Co., Cleveland, Ohio.]

PHONOGRAPH DIAPHRAGM WITH RUBBER RING.

The old method of holding the mica diaphragm of a phonograph sound box in place possessed many inherent defects. For instance, the invariable rubber gasket usually held the delicate sheet of mica rigidly, thereby depriving this vibrating membrane



of complete efficiency. The new idea, shown in the accompanying cut, consists of molding a ring of rubber stock around the mica disk and thus vulcanizing it in a mold. The result is increased tone production and the elimination of troublesome mechanical noise. [Wm. Eggers & Sons, Brooklyn, New York.]

THE THRISHER TRENCH COAT.

This overcoat is especially adapted for war purposes and has received the commendation of the British War Office. It is

double-breasted, with an extra high collar, and while waterproof and windproof, it combines warmth with lightness in weight. A chrome-dressed sheepskin lining is used or, if preferred, a detachable "Kamelcote" or detachable sheepskin lining is supplied. Knee flaps and saddle gussets are provided for mounted officers. [Thresher & Glenny, London, England.]



THE "GNIDROC" COAT.



A somewhat similar waterproof overcoat, especially suited to war uses, called the "Gnidroc," is shown in the second illustration. This coat is made in the raglan style, and comes in three weights, with or without fleece lining. [Geo. Cording, Limited, London, England.]

THE "SANDERSON" RUBBER TRIPOD SHOE.

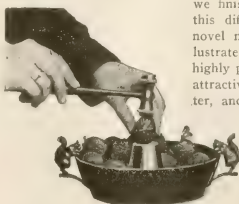
In photography, after the correct focus has been obtained, the slightest movement of the camera will necessitate a repetition of the entire operation. When a tripod is used on slippery ground or polished floors, merely taking hold of the ball and tube, or inserting the plate-holder is apt to cause the tripod legs to slide, thus



upsetting the camera. The rubber tripod shoe here shown presents a simple means by which all danger of these accidents may be avoided. It is made in three sizes, and will stretch to fit tripod feet of any shape. When not in use it may be left in position or removed by rolling back the rounded edge. [The Altrincham Rubber Co., Altrincham, England.]

NUT CRACKING DEVICE WITH RUBBER RINGS.

We used to crack nuts in the kitchen, with a flatiron between our knees, and the floor was apt to be strewn with shells before



we finished. A way to overcome this difficulty is presented in the novel nut-cracking device here illustrated. The bowl is made of highly polished hard wood, with an attractively plated steel anvil center, and a hammer also plated to match the anvil, the wooden hammer handle being finished the same as the bowl.

This outfit is intended for use on the finest dining room table, and the hammer is encircled at each end with rubber rings, which overcome all danger of scratching or marring any polished surface upon which it may be laid. [Parsons Nut Bowl Co., Indianapolis, Indiana.]

THE "UNIVERSAL" TUBULAR BED.

An improvement in the air or water cushion beds so useful in hospitals and sick rooms is the tubular bed that is illustrated herewith. Instead of only one compartment, this bed is composed of ten separate tubes. The advantages of this construction are that the patient's comfort is more readily secured, as the tubes can be regulated so as to relieve pressure on the body;



additional tubes may be added so any part of the body can be raised, or the tubes, even when filled with water, can be inclined to any desired angle, while the ordinary water bed can be used only in a horizontal position.

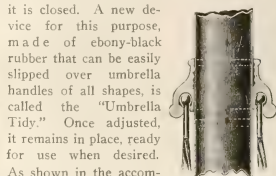
An important point of superiority that is claimed over the old form lies in the fact that in case of injury or accident to any section, the entire bed is not put out of commission, the imperfect tube simply being withdrawn and an extra one inserted, without disturbing the patient. [The Altrincham Rubber Co., Altrincham, England.]

THE "UMBRELLA TIDY."

In order to keep an umbrella cover from fraying at the edges, it is recommended that the ribs be fastened firmly together when



OPEN.



CLOSED.

it is closed. A new device for this purpose, made of ebony-black rubber that can be easily slipped over umbrella handles of all shapes, is called the "Umbrella Tidy." Once adjusted, it remains in place, ready for use when desired. As shown in the accompanying illustration, a touch of the finger tips is all that is needed to reverse the position of the holder for the release or attachment of the umbrella ribs. [Reliance Rubber & Hardwood Co., London, England.]

The Obituary Record.

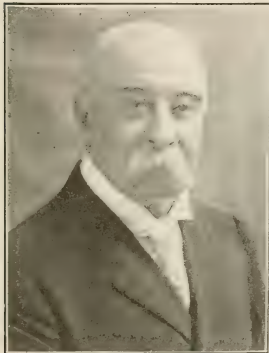
WATSON H. LINBURG.

WATSON H. LINBURG, president of the United & Globe Rubber Cos., and prominent in the business activities of his state, died after a long illness on January 5 at his home in Trenton, New Jersey, aged 76 years.

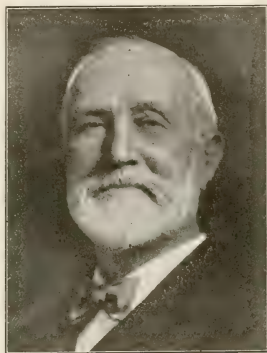
Mr. Linburg was born December 5, 1839, in Conshohocken, Pennsylvania. In his early manhood, during the Civil war, he enlisted in the Union Army, was taken prisoner at Chancellorsville and spent a long time in Libby prison. After the war he engaged

found but little time for outside interests. He was, however, a member of the Woonsocket Business Men's Association, the Friendly Sons of St. Patrick and the Christian Doctrine Society of St. Charles' Church.

After the funeral, which was conducted by the Rev. John H. Whitaker, 150 employees from the factory formed two lines between which the mourners marched, followed by bearers conveying the casket. The pallbearers, who were all men holding responsible positions in the Woonsocket factory, were as follows:



WATSON H. LINBURG.



WILLIAM LYALL.



MICHAEL M. FLYNN.

in the dry goods business until he transferred activities to the rubber field.

Mr. Linburg's connection with the rubber industry dated from 1878, when he became a member of the Hamilton Rubber Co. With characteristic thoroughness, he mastered all the details of the business and it was not long ere he was regarded as an authority in his line. In addition to filling the office of president of the United & Globe Rubber Cos., he was president of the Globe Tire Co., vice-president of the Spring Lake Hotel Co., and served as director of the First National Bank of Trenton, the Standard Fire Insurance Co., the Inter-State Fair Association and the Mercer Hospital. He was vice-president of the Lotus Club of Trenton and member of the following organizations: Trenton Country Club, Golf Club of Spring Lake, Railroad Club of New York, Historical Society of Pennsylvania, Pennsylvania Society and the Trenton Masonic Lodge. He is survived by his widow and a daughter, Mrs. Horace B. Tobin.

MICHAEL M. FLYNN.

Michael M. Flynn, general manager and superintendent of the Woonsocket factory of the American Wringer Co., died on December 30, 1915, after a brief illness.

Mr. Flynn was born in Woonsocket, Rhode Island, January 3, 1858. When a mere lad he entered the employ of the Bailey Wringing Machine Works, which factory later became the Woonsocket factory of the American Wringer Co. He gradually worked himself through the different departments of the concern and was made superintendent in 1890, and for the last quarter century he has devoted all his energies to the promotion of the wringer business. Ever absorbed in his family, Mr. Flynn

Jesse P. Walsh, John F. Sweeney, John T. Gahan, William Makins, Samuel N. Greenwood, James W. Quinn, Charles Yahraus and William Fogarty.

Mr. Flynn is survived by his widow, two sons and two daughters.

WILLIAM LYALL.

William Lyall, venerable president of the Brighton Mills, Passaic, New Jersey, designer of innumerable types of tire fabrics, died suddenly on January 13 in the seventy-sixth year of his age. He was the son of Charles Lyall, of Dunfermline, Scotland, and Mary Cooper, of Perth, Scotland. The father came to the United States in 1839, and soon laid the foundations of a prosperous commercial career.

William Lyall was born on October 28, 1840, in Jersey City, New Jersey, and in 1861 commenced his commercial career. Success marked his efforts from the start, and he rapidly built up a thriving business, being successively connected with the Planet Mills, the United States Corset Co., the Chelsea Jute Mills and other manufacturing enterprises.

In later years he established the J. & W. Lyall Loom and Machine Works, for the manufacture of textile machinery, particularly the positive motion loom, of which his brother and partner, James Lyall, now deceased, was the inventor. This loom was a marked improvement in weaving machinery, and was the basis of many other textile enterprises. Associated with his brother in the early development of special fabrics, he was the pioneer in tire fabric making, that has developed from the hose pipe bicycle tire of 1895, to the present day auto tire of exacting requirements.

William Lyall will long be remembered by his many friends in the rubber tire trade with genuine appreciation and regard. His inherent courtesy of manner and genial kindness endeared him to those who were fortunate enough to come within the sphere of his influence.

At the time of his decease, Mr. Lyall was senior member of the firm of J. & W. Lyall and also president of the Brighton Mills, manufacturers of standard and special tire fabrics, Passaic, New Jersey. He was a director in several banks and fire insurance companies, and identified with various social and charitable organizations, and also a member of the Union League Club, and the Chamber of Commerce of New York City. He has had a long and intimate connection with St. Andrew's Society, having served as manager, second vice-president, first vice-president and president.

Mr. Lyall is survived by his widow and six sons and daughters: William L. Lyall, treasurer of the Brighton Mills; Charles E. Lyall, Herbert J. Lyall, Kitty E. Lyall, Earl H. Lyall and Pamela W. Lyall.

GEORGE H. F. SCHRADER.

George H. F. Schrader, formerly president of A. Schrader's Son, Inc., Brooklyn, New York, died on November 15 on ship-board while en route from Iceland to Norway.

Mr. Schrader, who was 57 years of age, was the inventor of the Schrader valve for pneumatic tires. He withdrew from the business in 1904 and he devoted his attention largely to philanthropic and humanitarian work. In 1907 he gave the "Caroline Rest" to the New York Association for Improving the Condition of the Poor, and since then supported this home practically unaided.

He spent his last few years abroad. In Iceland he interested himself in the 50,000 ponies that in winter are turned out to forage for themselves. He built shelters for the ponies and conducted a campaign of education among the people. He also established a "Caroline Rest" for needy Icelanders.

FREDERICK J. ALDEN.

On January 14 Frederick J. Alden, who had been in the employ of the Boston Belting Co. for thirty-seven years, passed away at his home in Winthrop, Massachusetts, after a four months' illness.

Mr. Alden was born in Somerville, Massachusetts, 60 years ago, and was educated in the public schools of that city. He started in the grocery and provision business in that city, and was quite successful, until a fire totally destroyed his business establishment. He then entered the employ of the Boston Belting Co., and later was promoted to the position of traveling salesman. For 30 years he represented the company in New England, the Maritime Provinces and the North Atlantic states. Possessed of a genial nature he was counted as a personal friend by his host of customers. He was an Elk, and a member of the United Commercial Travelers' Association. He married Miss Alice C. Olmstead, of Chelsea, who survives him.

J. K. LINDSAY.

J. K. Lindsay, office manager of the Toronto branch of the Canadian Consolidated Rubber Co., Limited, Montreal, Canada, died on December 26 after a brief illness.

Mr. Lindsay's business experience began with the Munster Bank in Ireland. After five years' service, he developed the spirit of adventure, traveling extensively for several years. Finally he settled down in Canada, where he obtained employment in the Canadian Bank of Commerce. Later he was offered the position of financial manager by a Montreal shoe manufacturing and jobbing house, where he acquired considerable experience in the footwear trade. Leaving this, he became secretary-treasurer of the J. D. King Co., where he remained until 15 years ago, when he entered a partnership in the rubber

and leather footwear business. On the dissolution of this partnership four years ago, he became accountant and office manager of the Toronto branch of the Canadian Consolidated Rubber Co., Limited.

During his entire life Mr. Lindsay was a keen student of men and affairs, and his dealings typified honor, fair-mindedness and zeal.

ERNST ULE.

A late number of the "Tropenpflanzer" chronicles the death in Berlin of Ernst Ule, one of the leading authorities on Brazilian rubber trees.

Professor Ule, who for many years held an important scientific position at the Botanic Gardens in Rio de Janeiro, from 1900 to 1903, explored not only the upper Amazon as far as the Peruvian frontier, but also the tributaries of that great river. On this tour he studied rubber plants and discovered a number of the *Hevea* varieties. He is credited with having first discovered the *Castilloa Ulei*, which bears his name. His account of the results of these studies is given in Engler's "Botanischen Jahrbüchern," XXXV, Fifth Edition, under the title of "The Rubber Plants of the Amazon Expedition and Their Meaning to the Geography of Plants." In the "Tropenpflanzer" (1905 Supplement I) he told of this expedition in an article entitled "Rubber Gathering and Rubber Trading on the Amazon," and in the same publication (page 788, 1907) he contributed "The *Hevea Discolor* as Producer of Rio Negro Rubber." An important book of his is entitled "The Vegetation of the Amazon Country."

On his return to Germany from Brazil, Professor Ule arranged and classified his extensive collections of tropical plants, and in 1906, the Bahia Rubber Syndicate of Leipzig sent him as expert to investigate the home of the Ceara rubber. On this expedition he discovered three new species of the *Manihot* variety and brought their seeds to Europe whence they were distributed to plantations throughout the world. He also wrote a book on these plants which he called *Manihot Dichotoma*, *Manihot Heptaphylla* and *Manihot Piauhyensis* and which produce Jequie, Sao Francisco and Piauhay rubber, respectively.

Professor Ule made his last long trip from 1908 to 1912, when he explored the northern branches of the Amazon and went as far as British Guiana. It is said he was the first expert to explore the Acre territory, which of all Brazilian land is richest in rubber. As a recreation during this tour in 1910 he visited Ceara and found time to make a thorough study of the "Boll Disease" of Ceara rubber. He was continuing the work on this subject when death overtook him.

Botanic science loses in Professor Ule a man of unusual strength, a tireless, energetic worker, a reliable investigator and a careful collector. He possessed a constitution that adapted itself to the damp, mosquito infested climate of the Amazon wilderness which enabled him to accomplish results where others have failed. Unlike many explorers he was equipped for his work by a thorough botanical education.

G. LEONARD PORTER.

G. Leonard Porter, managing partner in the Market Harboro Rubber Co., died December 11, 1915, in London, after a short illness. Mr. Porter belonged to a well-known Leicester family and was for 20 years associated with the company, during the latter portion of which period he served as managing director. He was about 40 years of age and unmarried.

HENRY SPEAKMAN.

Henry Speakman, head of the firm of Henry Speakman & Sons, rubber and asbestos merchants, Manchester, England, died suddenly at Brooklands in the 73rd year of his age. As a young man, over 50 years ago, Mr. Speakman started on his own account as a rubber merchant and mill furnisher, and later admitted his two sons to membership in the firm.

News of the American Rubber Trade.

ANNUAL MEETING OF THE REPUBLIC RUBBER CO.

THE fifteenth annual meeting of The Republic Rubber Co., Youngstown, Ohio, was held January 24 at the general offices in Youngstown.

The management reported that the tire business of the company had increased 69 per cent in 1915 over the previous year, and that all mechanical goods departments, which constitute about one-half of the concern's business, showed satisfactory increases, with the exception of the railroad supply department for air brake hose, steam hose, etc. In this line, demand and prices were very poor until the latter months of the year. At present there is marked improvement in volume and a little betterment in prices.

Taking all departments into consideration, the company had more business on its books January 24 than on any date in its history, and prospects are good.

The usual cash dividends at regular rates were declared. The old officers were re-elected as follows: Thomas L. Robinson, president; L. T. Petersen and J. H. Kelly, vice-presidents; C. F. Garrison, secretary; M. I. Arms, 2nd, treasurer. There were two additions to the board of directors: Henry M. Garlick, president of the Standard Oil Cloth Co., and R. E. Cornelius, president of the Mahoning National Bank.

David Tod, who has served on the board for some years, was not re-elected, at his own request, owing to the many calls upon his time; this being done with the understanding he will return to the board at an early date.

The board of directors is as follows: M. I. Arms, Robert Bentley, C. H. Booth, J. H. Kelly, L. T. Petersen, Thomas L. Robinson, John Tod, H. K. Wick, John C. Wick, H. M. Garlick and R. E. Cornelius.

WASTE MATERIAL DEALERS HAVE NEW QUARTERS.

The headquarters of the National Association of Waste Material Dealers have recently been removed from 170 Summer street to 185 Summer street, Boston, Massachusetts, where a suite of offices on the top floor of the Brown Building has been equipped with all the conveniences which members could desire. One of the offices has been fitted up especially as a room for members, with telephone and other conveniences, and should prove an attraction to those visiting Boston.

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of the shares of rubber manufacturing companies on January 25 last are furnished by John Burnham & Co., 31 Nassau street, New York, and 41 South La Salle street, Chicago, Illinois:

	Bid.	Asked
Apex Rubber Co., common.....	71	71 1/4
Firestone Tire & Rubber Co., common.....	730	730
Firestone Tire & Rubber Co., preferred.....	113	113
Fisk Rubber Co., common.....	117	120
Fisk Rubber Co., 1st preferred.....	109	112
Fisk Rubber Co., 2nd preferred.....	109	112
Goodrich Co., The B. F., common.....	71 1/4	71 3/4
Goodrich Co., The B. F., preferred.....	110	112
Goodyear Tire & Rubber Co., common.....	340	345
Goodyear Tire & Rubber Co., preferred.....	114	115
Goodyear Tire & Rubber Co., 2nd preferred.....	109	112
Kelly-Springsfield Tire Co., common.....	73	74
Kelly-Springsfield Tire Co., 1st preferred.....	96	96 1/2
Kelly-Springsfield Tire Co., 2nd preferred.....	74 1/2	75
Miller Rubber Co., common.....	270	275
Miller Rubber Co., preferred.....	113	115
Portage Rubber Co., common.....	70	72
Portage Rubber Co., preferred.....	102	106
Somerset Tire & Rubber Co., common.....	87	89
United States Rubber Co., common.....	74	74 1/4
United States Rubber Co., preferred.....	107 1/4	108

THE HODGMAN NEW YORK OFFICE MOVES UPTOWN.

The completion of the interior furnishing and final preparations for occupancy of the Hodgman Rubber Co.'s new general office building at Tuckahoe, New York, marked an epoch in the history of that progressive company.

A full description, with an illustration of the building, then being erected, was published in the September issue of THE INDIA RUBBER WORLD, when it was stated that this company would move its entire office force from 806 Broadway, New York, to the new quarters, by January 1.

This, however, was impossible, owing to delays in construction work, and the removal was therefore deferred until January 29, when it was systematically accomplished without the slightest inconvenience to the routine of business.

A New York sales office has been established at 8 West Fortieth street, where the goods manufactured by the company will be displayed and customers served by an adequate sales force. This very central location, in the heart of the growing up-town business district, is most convenient. The nearby New York Central and Pennsylvania Railroad terminals, and the hotel district, make access easy to out-of-town buyers. Here the New York City trade will be handled by direct wire connection with the factory and an efficient auto-truck service will insure prompt delivery to local New York points. Out-of-town freight and express shipments will also reach their destination without appreciable loss of time, due to superior advantages afforded by effective co-operation of salesroom, general offices and factory.

VIOLATORS OF UNITED STATES CUSTOMS LAWS FINED.

When the neutrality squad of the United States Secret Service discovered that rubber constituted the contents of various trunks and boxes belonging to Mrs. Annie Dekkers, a passenger booked for Holland on the steamship "Ryndam," an interesting state of affairs was revealed. The sequel of this story as recorded in THE INDIA RUBBER WORLD, January 1, found an ending last month before Judge Clayton, of the Federal Court of the United States.

Subsequent to the indictment of the five persons found guilty of conspiracy in violation of the United States customs laws, by the federal grand jury, the following fines were imposed by Judge Clayton: Max Jaeger, \$1,500; Edward Weber and Paul Schmidt, \$750 each; Richard Wohlberg, \$100, and the Rubber & Guayule Agency, Inc., \$50. Mrs. Annie Dekkers, who was also indicted, but unable to appear in court on account of sickness, was later fined \$250, by Judge Clayton.

RUBBER CLUB INTERMEDIARY FOR RUBBER & GUAYULE AGENCY, INC.

When the British consul at New York refused to accept guarantees from the Rubber & Guayule Agency, Inc., recently fined in the federal court for breaking the customs laws, the Rubber Club of America, Inc., foresaw that an injury to innocent manufacturers would result. Accordingly it took up the matter vigorously with the British consul, who finally accepted the club's offer to act as intermediary. The result is that all contracts entered into with the Rubber & Guayule Agency, Inc., prior to December 21, 1915, will be handled through the Rubber Club.

PEACE SHIP CARRIED RUBBER IN PARCELS POST.

From a recent report issued by the British Foreign Office it appears that on searching the steamship "Oscar II.," of erstwhile peace fame, 55 bags containing rubber were discovered in the parcels post mail. It is estimated that the amount of rubber thus apprehended was 4,000 pounds.

RUBBER COMPANY DIVIDENDS.

A quarterly dividend of 2 per cent on the first preferred stock and a quarterly dividend of 1½ per cent on the second preferred stock of the United States Rubber Co. was paid January 31, 1916, to stockholders of record January 15, 1916.

A quarterly dividend of 1¼ per cent on the preferred stock of the Westinghouse Electric & Manufacturing Co. was paid January 15, 1916, and a dividend of 1½ per cent on the common stock, January 31, 1916, both to stockholders of record December 31, 1915.

The directors of the Ajax Rubber Co. have declared a quarterly dividend of 3 per cent on the common stock of the company, payable February 1, 1916, to stockholders of record January 15, 1916.

A quarterly dividend of 3 per cent on the common stock of the Kelly-Springfield Tire Co. has been declared, payable February 1, 1916, to stockholders of record January 15, 1916.

THE NEW SHIPPERS EXPORT DECLARATION.

Attention has been called by the Department of Commerce to the "Shippers' Export Declaration and Export Procedure," issued December 14, 1915, containing regulations superseding those issued on September 15, 1915. The new order becomes effective February 1, 1916, instead of January 1, as originally planned, and as mentioned in THE INDIA RUBBER WORLD of December, 1915. As this pamphlet gives complete instructions and samples of blank forms for export shipments, it is important that all rubber manufacturers doing export business should have a copy, thus avoiding inconveniences and delay. Copies may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., on application.

CRUDE CHICLE.

The Board of United States General Appraisers sustained the protests of Schutte, Bunemann & Co., New York City, and the American Chicle Company, St. Louis, Missouri, claiming that certain importations of chicle, which were returned as "refined chicle" should have been classified as "crude chicle." The merchandise was returned at 20 cents per pound under the provision in paragraph 36, act of 1913, providing for "chicle, refined or advanced in value by drying, straining, or any other process or treatment whatever beyond that essential to the proper packing." Under the same paragraph, it is claimed to be dutiable at 15 cents per pound as "crude chicle."

CHANGES IN AMERICAN CHICLE CO.

At the annual meeting of the American Chicle Co., Darwin R. James, Jr., C. D. Smithers, Warren C. Hayden, Silas B. Adams, Adam P. Leighton and George H. Worthington were elected directors. Mr. James was chosen president and Mr. Adams, vice-president.

TIRE REPAIR MATERIALS.

"Rie-Nie" is a new self-vulcanizing rubber compound for use on tire tubes, rubber footwear, etc., which is said to be an improvement on the customary patch. It is tough, strong, elastic and when it dries becomes a part of the rubber. [Durkee-Atwood Co., Minneapolis, Minnesota.]

Another new repair material is "Jovo," a tire seal claimed to preserve the rubber of the tire while preventing punctures. It is injected into the tube, the motion of which distributes it over the inner surface, and when a puncture occurs the air in the tube forces Jovo into the hole, as a sort of plug. A \$2 can is supposed to be sufficient for a 3½ to 4½-inch tube. [Joseph A. Vogel Co., Wilmington, Delaware.]

PERSONAL MENTION.

Theodore Hofeller, president of Theodore Hofeller & Co., Buffalo, New York, accompanied by Mrs. Hofeller, is spending the winter in Pasadena, California. Their son, Eugene D. Hofeller, is looking after his father's interests in the waste material business and also in the New Columbus Buggy Co., the Buffalo Electric Vehicle Co., and the Wellsville & Buffalo Railroad Corporation.

E. E. Wadbrook, of the firm of Arnold & Zeiss, New York City, has gone to Pinehurst and will spend his winter vacation golfing.

Kenneth Elwell, formerly with the Walpole Tire & Rubber Co., has accepted the position of factory manager of the Mechanical Rubber Co., Chicago, Illinois.

Freeman Carey has been appointed manager of the rubber department of The Carborundum Co., Niagara Falls, New York. He will have charge of the manufacture of vulcanite emery wheels.

The trade will be glad to know that C. H. Arnold, of the firm of Arnold & Zeiss, who for some months has been exceedingly ill, has recovered and is again at the Boston office.

S. P. Woodward has been promoted from the position of manager of the tire department of the New Jersey Car Spring & Rubber Co., Jersey City, New Jersey, to that of general manager.

Harry D. Dean, formerly assistant purchasing agent of the Davol Rubber Co., Providence, Rhode Island, resigned on January 1 to become purchasing agent of the Davidson Rubber Co., Charlestown, Massachusetts.

F. W. Dunbar, manager of Aldens' Successors, Ltd., New York City offices, spent a short vacation last month in the mountains of South Carolina.

Dr. L. H. Baekeland, on January 11, was awarded the Perkin medal for applied chemistry, by the New York Section of the Society of Chemical Industry.

H. B. Niblette has resigned his position as general manager of the Buffalo, New York, branch of The F. B. Goodrich Co., Akron, Ohio, with which company he was connected for seventeen years.

E. Stevenson, managing director of Aldens' Successors, Ltd., returned to London last month after a short business trip to New York.

A. H. Sommers, formerly with the New Jersey Car Spring & Rubber Co., Jersey City, New Jersey, has become associated with the Peerless Rubber Manufacturing Co., New York City, as its representative in Tennessee, Arkansas, Mississippi, Alabama, Kentucky and Missouri, with headquarters at Memphis, Tennessee.

Charles W. Harris has been appointed Western manager, with offices in the Hearst Building, San Francisco, California, for the Perfection Tire & Rubber Co., Chicago, Ill., and has resigned as district sales manager for the Seattle branch of the Kelly-Springfield Motor Truck Co. to re-enter the rubber trade, with which he was formerly connected for 18 years.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, announces the appointment of William Jameson as power superintendent. Mr. Jameson has been with the company since its inception.

R. F. Valentine has been appointed sales manager of the Standard Tire and Rubber Co., Cleveland, Ohio.

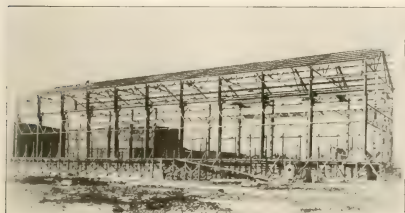
Roger Hardy, New York salesman for A. G. Spalding & Bros., has had a good deal of practical experience in the rubber business, from plantation to factory, a decided advantage in selling rubber sporting goods specialties.

ENLARGEMENT OF THE J. P. DEVINE CO.'S PLANT.

The J. P. Devine Co., Buffalo, New York, is constructing, as an addition to its plant, a steel and tile building 203 feet long, 60 feet wide and 60 feet high.

This extension will be devoted entirely to the manufacture of special apparatus for the chemical industry. This branch of the company's business has increased extensively during the past two years, and its apparatus has become well and favorably known.

Since undertaking the above extension the Devine company has also taken over the entire plant of the Pitts Agricultural



STEEL CONSTRUCTION OF J. P. DEVINE CO.'S NEW FACTORY.

Works of Buffalo, to do special casting work made necessary by the unprecedented activity of the chemical industry.

The Devine company is building plants for manufacturers for the production of various chemicals including all dyestuffs and higher intermediate colors, the making of which was confined to Germany prior to the present war. The development of this industry is most important not only because the attainment of the necessary standard in the production of colors will render this country independent of foreign sources of supply, but with suitable apparatus American workmen can nitrate with equal facility benzol, toluol or phenol for the manufacture of aniline oil, or high explosives.

NEW INCORPORATIONS, WITH AUTHORIZED CAPITAL. ETC.
1915 AND 1916.

Akron Repair & Tire Co., The, January 12 (Ohio), \$5,000. P. J. Hooker, S. D. Brewster and A. Q. Ross. To deal in new and second-hand automobile tires and supplies, etc.

American Auto Accessories Co., December 24 (Delaware), \$5,000,000. Joseph F. Curtin, S. A. Anderson and Samuel B. Howard—all of 36 Nassau street, New York City. To manufacture and deal in pneumatic tubes, tires, etc.

American Tire Fabric Co., December 28 (Massachusetts), \$1,500,000. John L. McIver, 15 Ridge Road, Mattapan, Francis L. Auld, 403 Sudbury Building, Boston—both in Massachusetts, and Howard K. Wood, 36 Nassau street, New York City. Offices, Boston, Massachusetts, and New York City. To manufacture, buy and sell cotton yarns and other textile fabrics.

Badenhop Co., Inc., Robert, December 28 (New York), \$100,000. Robert Badenhop, 13 Jones street; Harold W. Holcombe, 147 Bostwick avenue, and Sloan Lamont, Jr., 115 Wayne street—all in Jersey City, New Jersey. Brokers in goods of any kind.

Cooper Metal Co., Inc., A., January 4 (New York), \$25,000. Abe Cooper, 815 South State street; John J. Hughes, 307 Clarendon street; Abraham Rubenstein, 374 West Onondaga street—all in Syracuse, New York. To deal in metals, rubber, etc.

De Mattia Bros., January 10 (New Jersey), \$100,000. Peter De Mattia and Barthold De Mattia—both of Clifton, and Frederick W. Gaston, Passaic—both in New Jersey. Office, River Road and Prescott avenue, Garfield, New Jersey. To manufac-

ture metal molds to be used for manufacturing rubber goods, etc.

Duralex Co., The, January 18 (New Jersey), \$250,000. Frederick E. Kip, Crestmount Road, and Herbert M. Lloyd, 24 Lloyd Road—both in Montclair, and Ira A. Kip, Jr., Ridgewood Road, South Orange—both in New Jersey. Office, 768 Frelinghuysen avenue, Newark, New Jersey. To manufacture and deal in rubber, rubber substitutes, textile fabrics, etc.

Excelsior Raincoat Co., Inc., January 26 (New York), \$10,000. Julius S. Levy and David N. Levy—both of 20 East 111th street, and Joseph Levy, 504 West 122nd street—both in New York City. Rubber apparel, etc.

Habirshaw Electric Cable Co., Inc., January 26 (New York), \$925,000. Edwin W. Moore, 17 Battery Place, Joseph W. Murphy, 40 Wall street—both in New York City, and James B. Gauraglia, Hoboken, New Jersey. To manufacture insulated wire, etc.

Jaffess, Inc., Leon, December 30 (New York), \$5,000. Leon Jaffess, 1837 Clinton avenue; Otto Pershitz, 673 East 176th street, and John M. Detjen, 61 Broadway—all in New York City. To manufacture tires, rims, auto parts, etc.

Johnson Tire Co., F. H., December 15 (Texas), \$10,000. Frank H. Johnson, William G. Bell, R. P. Tyler and Leonard D. Ormsby—all of Austin, Texas. Office, Austin, Texas. To purchase and sell goods, wares and merchandise, etc.

McClurg Tire Sales Co., Inc., January 4 (New York), \$10,000. James J. Fero and William Miller—both of 792 Seventh avenue, and Thomas F. McMahon, 1400 Broadway—all in New York City. Tires, tubes, auto accessories, etc.

Nesco Corporation, January 3 (New York), \$25,000. Rena A. Manes and Isabelle Manes—both of 7 Manhattan avenue, and Joseph P. Nolan, 25 Broad street—all in New York City. Rubber goods, steam packing, etc.

Northern Rubber Corporation, December 27 (New York), \$100,000. John E. Doane, 27 West Forty-third street, and James E. Taylor, 294 West Ninety-second street—both in New York City, and Knut Wideem, 1710 Caton avenue, Brooklyn, New York. Rubber and synthetic rubber manufacture.

Perfection Tire Sales Co. of West Virginia, December 1 (West Virginia), \$25,000. W. M. Faw and E. H. Faw—both of Albert; J. C. Faw, Elkins; R. D. Heironimus, Davis, and H. F. E. Hinebaugh, Thomas—all of West Virginia, and C. J. Simpson, Cumberland, Maryland. To manufacture tires.

Release Tire Valve Co., Inc., January 4 (New York), \$10,000. Norman A. Crumb, 622 Gurney Building; Erwin G. Nichols, 540 Gurney Building, and Abraham Edelstein, 622 Gurney Building—all in Syracuse, New York. To manufacture tires, valves, etc.

Rock Tire Manufacturing Co., Inc., The, January 18 (New York), \$500,000. George E. Whipple, 1845 Coney Island avenue; Thomas M. McGrath, 133 Rogers avenue—both in Brooklyn, New York, and Harry J. Vellebi, 171 Sixteenth avenue, Long Island City, New York. To manufacture automobile tires, etc.

Story, Browning & Trainer, Inc., December 30 (New York), \$75,000. Ernest D. Story and Elmer G. Story—both of 1328 Broadway, and J. N. Trainer, Jr., 381 Fourth avenue—both in New York City. Rubber tires, automobiles, etc.

Surinam Rubber & Wood Plantation Co., December 6 (Delaware), \$250,000. Joseph F. Curtin, H. O. Coughlan, and S. A. Anderson—all of 36 Nassau street, New York City. To deal in rubber, metals and minerals and products of all kinds, etc.

Tire Service Corporation, Inc., January 4 (New York), \$10,000. Rex C. Northwood, Jules E. Hut and Rose Greenwald—all of 1779 Broadway, New York City. Auto supplies, pneumatics tires, etc.

Tubeless Tire & Rubber Co., The, January 3 (Ohio), \$75,000. O. J. Hicks, G. B. Helmutz, J. Lemmon, D. R. Messner and W. R. Price. Office, Millersburg, Ohio.

Universal Raincoat Co., Inc., January 10 (New York), \$3,000. Marcus Berman and Louis Berman—both of 136 East 112th street, and Max Herman, 414 East Tenth street—all in New York City. To manufacture rubber clothing, etc.

THE MANAGER OF THE CRAVENETTE CO.

THE trade generally is familiar with the term cravenette, but all are not so well acquainted with the fact that the improved processes by which textiles, felt goods and even leathers are made water-repellent or waterproof are to a large extent due to one man, Herbert P. Pearson, the subject of this sketch.



H. P. PEARSON

Mr. Pearson was born in Manchester, England, in 1877, and received his education in that city, graduating from a four years' course at Manchester University, with degree of Master of Science in chemistry. Then he spent a year in Germany, studying dyeing, and at a mill in Alsace, familiarizing himself with spinning, weaving and finishing.

Returning to England he associated himself as chemist to the Bradford Dyers' Association, Limited. This position he occupied for seven years, spent largely in the works, where he gained unique practical experience in all the processes through which textile piece goods pass after weaving.

Then he went to London as consulting chemist, specializing in bleaching and waterproofing textiles, and as manager of Pearson Patents, Ltd., and so remained until, in 1910, the Cravenette Co. U. S. A., secured his services in establishing in this country processes of his invention for waterproofing straw hats. The next year he again visited this country to start a process for damp-proofing shoes, which he had been investigating in England.

In 1912, at the invitation of the late Langdon Geer, Mr. Pearson entered into the management of the business of the Cravenette Company, and since Mr. Geer's death in June, 1915, he became managing director of the company.

The Cravenette Company has recently broadened its policy and added to its lines of output. In September a new plant was established, devoted solely to the cravenette finishing of silk goods, to render them spot-proof. Recently this company has cravenette finished some rubberized cotton and silk goods, making the surface repellent, so that water does not cling to, or spot the cloth. A garment thus treated needs only to be shaken to become quite dry. This gives some indication of the extension of the field of endeavor of this company, an expansion due almost solely to the study and experimentation of Herbert P. Pearson.

TRADE NOTES.

The yarn department of J. Spencer Turner Co., 86 Worth street, New York City, has been consolidated with the business of C. H. & R. L. Stevens, Inc. Hereafter cotton yarns of all counts and descriptions will be supplied to the trade under the personal direction of C. H. and R. L. Stevens.

The Passaic Cotton Mills, Passaic, New Jersey, has purchased from the New England Cotton Yarn Co., one of the large spinning plants at New Bedford, Massachusetts, known as the Rotch mill. It has been entirely renewed to the extent of 55,000 spindles. Taylor, Armitage & Co., 346 Broadway, New York, selling agents for the Passaic Cotton Mills, are now in a position to protect their contracts.

If political conditions in Mexico permit, the Intercontinental Rubber Co. plans to start operations at its plant at Torreon, Mexico, this month, on a scale considerably above that possible at any time since 1913.

The Atlantic Transport Line, 9-11 Broadway, New York City, the well-known steamship company, has added four fast express

steamers flying the American flag to its trans-Atlantic service; an obvious advantage to both rubber importers and manufacturers.

The Continental Rubber Works, Erie, Pennsylvania, has just completed a new machine shop of steel and concrete, dimensions of which are 75 x 110 feet. It is equipped with an electric crane running the full length of the building. The company has also added to the plant a new factory building, 75 x 226 feet, four stories high, of steel and concrete construction, to be exclusively devoted to the production of automobile, motorcycle and bicycle tires. The company employs about 800 workmen.

At the second Annual Industrial Safety Exposition at Cleveland, Ohio, January 22 to 29, The B. F. Goodrich Co. made one of the largest displays, showing safety and sanitation methods in use at its Akron factory. These included a gear guard and safety switch box, an anti-scalding wash basin, a non-slipping ladder and a sanitary drinking fountain. A replica in miniature of the medical dispensary of the Goodrich plant was also shown.

The Mechanical Rubber Co., Chicago, Illinois, has opened an office in Detroit, Michigan, which will be especially devoted to the automobile lines of the company, and is in charge of W. G. Lindsey.

The Batavia Rubber Co., with factory at Batavia, New York, and general sales and financial offices in New York City, has recently increased its capital in order to extend its development. Charles M. Marvin, formerly of Blake Brothers & Co., has been elected treasurer of the company, and George W. Hodges, of Remick, Hodges & Co., has been added to the board of directors, both of New York City.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, announces that a readjustment of wages and a change in working hours have been made which affect all departments. Under the new schedule the working hours have been decreased from 55 to 50 hours a week, and overtime on week days will be paid for as time and a half, and on Sundays as double time. New piece work schedules for machine operators have also been adopted.

A fire occurred recently in the cloth drying room of the L. Candee & Co., New Haven, Connecticut, the damage being less than \$3,000.

Since the middle of January the B. & R. Rubber Co., North Brookfield, Massachusetts, has been obliged to resort to burning cord wood for steaming purposes owing to irregular receipts of coal via Albany. From 25 to 30 cords of wood have been required daily.

A serious fire is reported as having destroyed the shops of the Albany Tire Repairing Co., Albany, New York, on January 27.

The B. F. Goodrich Co., Akron, Ohio, has brought action against the Norwalk Tire & Rubber Co., Norwalk, Connecticut, manufacturer of a tire with white sides and a black tread in which the letter "N" is worked. The plaintiff claims that the trade design and color scheme is a close imitation of a tire it has been marketing, that the public is apt to be deceived by the new product, and that its business has suffered on account of this.

The Miner Rubber Co., Limited, Granby, Canada, has opened a wholesale warehouse in charge of Angus W. Douglas at Edmonton, Alberta, where a full line of rubber footwear will be carried.

The Pierce Co., East Rochester, New York, claims to have increased its output of "Vorite" 30 per cent. in 1915, and has made substantial additions to its plant.

The Batavia Rubber Co., Batavia, New York, is putting out a red tread tire.

TRADE NOTES.

During the holiday season the Chicago Rubber Clothing Co., Racine, Wisconsin, used for its correspondence its regular lithographed letterhead, in the lower left-hand corner of which was specially printed a green and red holly wreath inscribed with appropriate season's greetings.

The Faultless Rubber Co., Ashland, Ohio, has erected a new addition of modern fireproof construction to its factory which adds 30,000 square feet to the 135,000 square feet of floor space now in use. In the mill room, which will occupy the ground floor of the new structure, the mills and calenders will rest on concrete foundations extending to bed rock. The second floor will be devoted to various manufacturing departments. All machinery will be driven by electricity made in the factory from steam generated in 250 horse-power boilers by local natural gas.

The plant at Lowell, Massachusetts, formerly occupied by the Patterson Rubber Co., has been taken over by the R. B. Phillips Co., manufacturer of munitions.

The Okonite Co., New York City, has established at its factory a research department with J. P. Millwood in charge. Mr. Millwood was head of the Chemical Research Department of the United States Navy Yard at New York for 20 years, and is held in high esteem as a rubber chemist. Dr. Comfort A. Adams, professor of electrical engineering at Harvard University, is retained as consulting engineer of the new department.

Philip De Ronde, president of the Oriental Navigation Co., announces the removal of the company's offices to Room 1134, 17 Battery place, New York City.

A remarkable record of efficiency was made recently by the Quebec division of the Canadian Consolidated Rubber Co., Limited, Montreal, Canada, when 55,100 pairs of hip rubber boots required by the British army in Flanders, were finished in 45 days. These boots had special features, that added considerably to the work of making such as an extra heavy skirt and much wider mouth than the standard style and special straps at ankle and knee, with automatic buckles. A supplementary order has since been received by the company.

The rubber overflow trimmer made by Arthur Jackson Wills, North Brookfield, Massachusetts, has evidently qualified with the rubber trade. It is reported that 33 of these machines have recently been installed in the finishing room of one of the largest manufacturers of mechanical goods in the country.

In addition to the storage warehouse recently completed for the Electric Hose & Rubber Co., Wilmington, Delaware, on the eastern end of its mill, a second story, 30 x 225 feet, is being erected over the braiding room on the western side for the purpose of installing new braiding machines. Additional machinery is also being installed to take care of the demand for molded hose, which, when in place, will increase the daily capacity to about 125,000 feet.

At the thirteenth annual meeting of the Electrical Contractors' Association of Wisconsin, held in Milwaukee, January 17, 18 and 19, Henry A. Mors, vice-president of the Simplex Wire & Cable Co., read a paper on "The Manufacture of Insulated Wires and Cables," which was illustrated with motion-pictures and lantern slides.

In the announcement of promotions and changes in office and factory staffs of the Standard Underground Cable Co.'s plant at Perth Amboy, New Jersey, it is noted that H. W. Fisher continues as chief electrical engineer of the company, and in addition becomes manager of the lead-cable works and rubber wire and cable factories. Tracy D. Waring will be assistant manager of the lead-cable works and of the rubber-wire factory, and Albert C. Meyers will be superintendent of the rubber-wire factory.

THE NEW "USCO" TIRE.

The successful combining of rubber and fabric has never been a simple proposition, but in the new "Usco" tire it is claimed a practically perfect union has been effected and that the plies of fabric are so unified by the rubber that they cannot possibly separate.

This new tire, which has been subjected to the most severe tests, is adapted for use on small or large cars. The very attractive tread design is said to offer protection against skidding. The letters "U," with their curves and angles, grip and cling to the slippery roads. From the illustration it may be seen that the tread rubber is of unusual thickness, which feature adds to endurance and mileage. The company will also offer to the trade this season a new high grade cord tire under the name of "Royal Cord." [United States Tire Co., New York.]



THE MATTSON HAND-MADE TIRE.

The Mattson Rubber Co., one of the oldest rubber manufacturing companies in the United States, began chiefly as a druggists' sundries concern. From time to time it has, however, added other lines. One of its specialties today is the Mattson hand-made tire. The illustration shows the depressed type of non-skid used. This tire adds one more to the large list of distinctive American motor tires. [Mattson Rubber Co., Lodi, New Jersey.]



THE SIMMONS TIRE.

A new tire known as the "Simmons" promises to interest owners and manufacturers of auto trucks.

As will be seen in the accompanying illustration, this tire is made up of cylindrical rubber blocks, held in place by flanges and by rough-faced steel forgings that are tightly bolted through the rim of the wheel. After the rubber cylinders have shown wear, the bolts holding the forgings are loosened and the rubber blocks are turned, thus presenting a new wearing surface to the tread.

It is claimed that the rubber blocks can be turned at least six times and that each time the tire will be practically as good as new, that skidding is overcome and that better traction is obtained than with a dual tire. Each tire is guaranteed for 30,000 miles. [Modern Railway Appliances Co., Albany, New York.]



SMALL TIRES IN THE MARIJORY.

The tendency toward lighter weights in automobile construction is reflected in the reduced size of tires. The "Automobile" finds that, taking the average for all cars, the nearest regular tire size corresponding to this average figure is now 33 x 4 1/2 inches. In 1910 and 1911 the average size was 34 x 4 inches. This increased until 1914, when the average was raised to 35 x 4 1/2 inches. Since then it has declined.

ASHCROFT NOW A NEW YORKER.

RALPH W. ASHCROFT, who for three years has had charge of the publicity, as well as other matters, for the Canadian Consolidated Rubber Co., Limited, Montreal, Canada, has been appointed advertising manager of the "United States Rubber System," with headquarters at 1790 Broadway, New



R. W. ASHCROFT.

York City, where, in conjunction with his other duties, he will continue to supervise the Canadian publicity.

Mr. Ashcroft was born in Cheshire, England, some 40 years ago, and after graduating from Waterloo College came to New York City to act as private secretary to a railway president. After five years of this work, he entered commercial journalism. His connection with the rubber industry

was as manager of a New York export house and he is credited with having shipped the first American automobile tires to Europe, a set of which was put on King Edward VII's car.

Mr. Ashcroft has traveled extensively, and is a member of the Circumnavigators' Club, the only organization, it is said, of which both Taft and Bryan are members. He has visited the Far East, including India, Burma, Ceylon, Sumatra, Java and the Straits Settlements.

THE NATHAN TIRE COVER PATENT ADJUDICATED INVALID.

The Allen Auto Specialty Company, New York City, has lost its suit against E. G. Baker for infringement of the Nathan tire cover, patent No. 799,622. This suit was first brought into the courts in 1882, as recorded in the November, 1882, issue of THE INDIA RUBBER WORLD. Since that time the lower court had held the patent to be valid and infringed by E. G. Baker, who appealed, and the United States Circuit Court has now reversed the decision of the lower court in his favor.

"VULC-TITE" BLOW-OUT PATCH.

An inside locking blow-out patch that is adjustable to all sizes of casings is called the "Vulc-Tite." The extension flap, with a wide strip of vulcanizing rubber, is shaped to fold under the opposite side of the patch, which is cement coated. The patch seats itself and the pressure of the tube when inflated automatically vulcanizes the patch to itself. According to the claims made, there is no possibility of this patch bulging or spreading, as fastened to itself in this manner it forms a complete cylinder around the tube and holds the pressure as certainly as a casing clutched at the beads. [General Tire & Rubber Co., Akron, Ohio.]

Prices for all classes of rubber goods remain in the unsettled condition that of late has characterized these markets, although increases have been made in certain lines.

UNITED STATES TIRE CO. PROMOTIONS.

Samuel S. Poor, manager of the Philadelphia branch of the United States Tire Co., New York City, has been promoted to the position of district manager, including the centers of Philadelphia, Wilkes-Barre, Baltimore, Washington and Richmond.

Garfield List, formerly manager of the solid tire department, succeeds Mr. Poor as Philadelphia resident manager.

Charles C. Gehring, for four years resident manager of the Pittsburgh branch, has been made district manager, with supervision over the local branch, and also of the Buffalo and Wheeling branches.

E. H. Kidder, formerly manager of the Boston branch has been appointed New England manager, having charge of the Boston, Providence, Worcester, Bangor, Portland and Manchester offices with headquarters at Boston. J. Toomey will manage the Boston branch, Howard E. Crocker having been placed in charge of the Providence branch formerly managed by Mr. Toomey.

O. S. Johnson succeeds H. H. Hubbard as manager of the St. Louis branch, Mr. Hubbard being transferred to the home office of the company.

FIRESTONE APPOINTS DISTRICT MANAGERS.

The Firestone Tire & Rubber Co., Akron, Ohio, announces the appointment of three district managers with headquarters at the home office but to work with the sales organization in the field.

Dan C. Swander, formerly branch manager at New York City, will have charge of the eastern district. He will be succeeded in New York by C. D. Studebaker who becomes branch manager. E. W. BeSaw, formerly Des Moines branch manager, will look after the western district, and G. A. Spohr, former salesman, succeeds Mr. BeSaw as Des Moines manager. N. B. Burwell of the home office sales department will take care of the southern district.



E. W. BESAW.

D. SWANDER.

N. B. BURWELL.

In commenting on the new appointments R. J. Firestone, sales manager of the company, said: "These district managers will serve as an additional connecting link between the field organization and the home office. Our organization is growing so rapidly that we need more points of contact. With our output jumping 60 per cent. this year so that by early spring we will be turning out 12,000 pneumatic tires per day, our district managers will be able to render valuable and efficient service."

AUTOMOBILE WHEEL GAGE.

A patent factor in reducing the mileage of automobile tires is the tendency of the front wheels to get out of alignment. Wheels that do not run parallel have a side-slip that grinds down the tread of the tires even when they are being used under otherwise favorable conditions. As the wear is smooth, it often escapes the attention of the motorist, but it is nevertheless very important. A simple gage has recently been placed on the market, consisting of a light steel beam with diagonally braced uprights and an adjusting thumb screw, which can be used to quickly detect non-parallelism of automobile wheels. [Murray Fahnestock, Pittsburgh, Pennsylvania.]

NEW BUILDINGS OF THE FISK RUBBER CO.

The three new buildings of the Fisk Rubber Co., Chicopee Falls, Massachusetts, mention of which was made in the last issue of *THE INDIA RUBBER WORLD*, are illustrated in the photographs reproduced herewith. These buildings all lie on the tract of land situated between Grove street and the railroad and bring the total number of buildings comprising the plant up to 20.

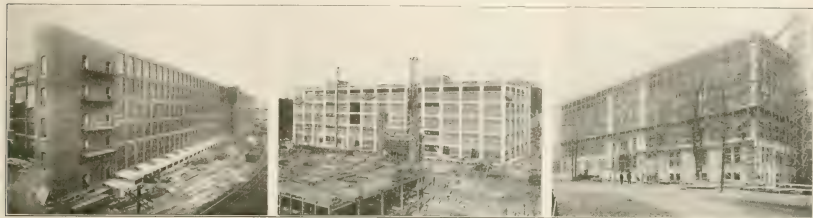
The administration building, of impressive appearance, is built of stone and tapestry brick and contains 70,000 square feet of floor space.

The five stories and basement of the new mill building have 388,800 square feet of floor space. This is said to be one of the best lighted mill buildings in New England. More than 90

tinuing as assistant superintendent. E. A. Krannich, who is superintendent of the Columbia Tire & Rubber Co., Columbiana, Ohio, which company is composed of the same stockholders and directors as the Mansfield company, will have charge of the "compounds" of both organizations. Mr. Krannich will be assisted at the Mansfield plant by A. J. Bethea, chemist.

The Universal Rim Co., Chicago, Illinois, has removed from 1301 to 1502 Michigan avenue, increasing its floor space about five times that previously used.

We are informed by the Akron Tire Co., Inc., Philadelphia, Pennsylvania, that the decision concerning the use of this name by a New York company operating in Pennsylvania, recorded in the December, 1915, issue of *THE INDIA RUBBER WORLD*, has been reversed. At a final proceeding before Judges Shoemaker, Pat-



NEW BUILDINGS OF THE FISK RUBBER CO.

per cent of its exterior surface is made up of windows fitted with prism glass, and four fire towers afford an unusual safeguard for the employees. The storehouse, which is also equipped with fire towers, sprinklers and prism glass windows, has half of the floor space of the new mill building. Tunnels connect it with the adjacent buildings, and a spur track on the south side will facilitate the handling of freight.

TRADE NOTES.

A new building is being erected for the Detroit, Michigan, branch of the Firestone Tire & Rubber Co., Akron, Ohio. It is to be a four-story structure, 181 x 300 feet, located at Woodward and Canfield avenues, and is expected to cost between \$30,000 and \$50,000.

The floor space of the Omaha, Nebraska, branch of the Goodyear Tire & Rubber Co., Akron, Ohio, is being increased to about 14,000 square feet. Last spring, when the branch first moved into its present quarters, it occupied about 5,000 square feet of floor space. A credit and a mechanical rubber goods department have been established.

The Norwalk Tire & Rubber Co., Norwalk, Connecticut, has purchased the land and buildings of the Norwalk Woolen Mills Co. at Winnipauk, a suburb of Norwalk, and reports selling its unused preferred stock, amounting to \$300,000, thereby securing a total working capital of \$500,000.

The Goodyear Tire & Rubber Co. of Canada, Limited, Toronto, Canada, has recently purchased 27 acres of land in New Toronto, about seven and one-half miles from the center of the city of Toronto. The company plans to build a new plant on this property for the manufacture of tires, continuing the plant now in operation at Toronto for manufacturing mechanical goods.

Several changes have been made in the factory management of the Mansfield Tire & Rubber Co., Mansfield, Ohio, owing to the resignation of George McConnell, formerly superintendent. Garth A. Dodge, a man of experience in the tire business, who has acted as mechanical engineer at the plant for the past eighteen months, had been appointed superintendent, George Whalon con-

terson and Bregy, the New York company was restrained from using the name of the Philadelphia company for advertising or business purposes in the State of Pennsylvania.

The Fisk Rubber Co. has opened a branch at 1313 New York avenue N. W., Washington, District of Columbia.

The Chester Rubber Tire & Tube Co., Chester, West Virginia, will receive bids in March for a plant to cost \$720,000. Three structures will be included, one 50 x 170 feet, another 40 x 75 feet, and the third 42 x 75 feet.

The Tubeless Tire & Rubber Co., Millersburg, Ohio, the notice of whose incorporation appears elsewhere in this issue, will make the King tire, which is claimed to be punctureless and which will be sold with a guarantee of 8,000 miles. The company expects to have employment for 100 men at the start, and an output of at least 100 tires a day. The officers are as follows: W. R. Price, president; O. J. Hicks and G. B. Helmuth, vice-presidents; G. A. Jordan, secretary and treasurer; C. T. Rood, assistant secretary; John Lemmon, assistant treasurer.

THE STANDARD FOUR IS MANUFACTURING TIRES.

The Standard Four Tire Co., Keokuk, Iowa, whose incorporation was mentioned in the October, 1915, issue of *THE INDIA RUBBER WORLD*, began operations on January 3. The company has erected a modern factory building which has been equipped with the latest tire-making machinery. It purchased its mill equipment from the Birmingham Iron Foundry, Derby, Connecticut, and its mold equipment and vulcanizers from the Adamson Machine Co., Akron, Ohio.

The officers are as follows: J. R. Beaver, president; C. F. McFarland, vice president; A. L. Higbee, secretary; E. A. French, treasurer, and W. J. Richards, formerly with the Jonesboro Tire & Rubber Co., Jonesboro, Indiana, general manager. The other directors are H. S. Charles and C. M. Rich. R. H. Sotherland, formerly factory manager of the Mansfield Tire & Rubber Co., Mansfield, Ohio, is superintendent, and has associated with him a number of practical men from Akron, who have charge of the different departments in the new plant.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

BUSINESS continues good in nearly all lines of rubber manufacture. The clothing men are not taking many orders just now, but their factories are running full time on orders and some overtime. Mechanicals are in pretty good demand, but really are busier than usual at this season of the year.

Footwear people have more business on their books than ever before at this particular season. The call for tennis goods has been unusually good, and while the withdrawal of prices on the 21st had a tendency to hold back orders, the manufacturers are confident of a big season's business. Drug sundries are being called for. Tires are being made in many cases to full capacity of the factories, and the advance of 10 per cent seems to have stimulated rather than retarded business.

* * *

The United States Rubber Co. will remove its Boston offices about March 1. It has leased the entire five-story building, 130 Essex street, corner of Columbia street, recently vacated by the Singer Manufacturing Co. Extensive alterations are in progress at this writing, which will greatly alter and improve the front of the building. The interior is being thoroughly modernized and arranged to house the footwear department on the first floor, while the four upper stories will be occupied by the clothing department in charge of N. Lincoln Greene.

The building is so close to the present offices of the footwear department and which until recently was the salesroom of the American Rubber Co.'s clothing sales department, that old customers will easily find it, while the patrons of the Stoughton Rubber Co. find it right in the heart of the ready-made clothing section and much more central than the old headquarters of that company on Summer street extension.

The contemplated consolidation of the Stoughton Rubber Co. with the clothing department of the American Rubber Co. has been consummated under the name of the American Rubber Co. The officers are: Lester Leland, president; Ira F. Burnham and N. Lincoln Greene, vice-presidents; H. H. Nance, treasurer; Homer E. Sawyer, general manager. N. Lincoln Greene will be manager of the clothing department, E. H. Hicks serving as assistant manager.

* * *

The Stoughton Rubber Co. has for years been the New England agents for the New York Belting & Packing Co. Now the latter company has decided to operate a branch store at 65 Pearl street, Boston, similar to the branches in several other leading cities. Fred J. Pickard has been appointed manager, and is now overseeing the changes to fit the new premises for the incoming stock. Mr. Pickard started with the Stoughton Rubber Co. 20 years ago and for 16 years has sold mechanicals in this territory.

* * *

The dedication of the new building added to the plant of the Apsley Rubber Co. at Hudson took place New Year's eve, when nearly 2000 employees and their families were entertained royally. This new factory building of 40 x 192 feet was given over for the occasion. Each floor was profusely decorated with bunting, evergreens and electric colored lights. A floor each was used for games, a musical and dramatic entertainment, refreshments, and a grand ballroom. Music was supplied by a band, an orchestra and a concert company. In every way the arrangements were carried out in the liberal manner which has always characterized Mr. Apsley's entertainments for his employees. The disappointment of the evening was that Mr. Apsley was unable to participate, as he was confined to his room at the Waldorf-Astoria, New York, where he has been ill with the grip for over a month. At present writing, however, he has so far recovered that he is expected to return to Hudson almost any day.

We shall soon have, in Massachusetts Bay, the largest crude oil motor yacht yet constructed in this country. This yacht is being built for Arthur H. Marks, vice-president of The B. F. Goodrich Co., Akron, O., and will measure 151 feet on the water line, 22 feet beam, and 7.6 feet draft. It is of steel construction and will have ten spacious staterooms for the owner and guests, besides ample accommodations for the crew. On the deck are located the dining, chart, music and smoking rooms. The motors are designed to develop 750 H. P. and the fuel tank capacity is sufficient for a trip across the Atlantic and return.

Mr. Marks is a yachting enthusiast and a member of the Eastern Yacht Club.

* * *

J. H. Learned, for the last 14 years sales manager of the Revere Rubber Co., will hereafter confine his efforts entirely to a few of the specialties of the company, turning over the general sales management to Walter B. Rigdon, who comes here from the San Francisco office. Previous to his going to the Pacific coast Mr. Rigdon was in the Pittsburgh office of the company.

The Revere Rubber Co., which is now occupying a portion of the office floor of the United States Rubber Co., will remove about March 1 to larger quarters.

* * *

Richard H. Rice, General Electric Co., Lynn, is president of the Associated Industries of Massachusetts, an organization recently formed for the purpose of studying proposed legislation affecting the industrial prosperity of the state and promoting beneficial measures. William H. Gleason, Revere Rubber Co., Chelsea, is president of the executive council, and Harry G. Fisk, Fisk Rubber Co., Chicopee Falls, and George E. Hall, Boston Woven Hose & Rubber Co., Cambridge, are members of the executive committee.

* * *

The new year brought substantial recognition to some two hundred employees of the Boston Woven Hose & Rubber Co., who had served the company for from 10 to 35 years. These workers assembled in the Cambridge works on New Year's afternoon and received gold coin to the total value of several thousand dollars, that was distributed according to length of service to those on the honor list. Addresses were made by J. W. Fellows, factory manager; Henry B. Sprague, treasurer, and George E. Hall, vice-president and general manager.

The annual election of officers of the Boston Woven Hose & Rubber Co. Mutual Benefit Association was held on December 13 with the following results: W. A. Briggs, president; W. H. Nolan, vice-president; George A. Mather, financial secretary; William Burgess, treasurer; Joseph I. Taylor, recording secretary; William G. McCarthy, Edward Butcher, F. R. Rowe, Thomas Gormley, J. C. Long, Charles Laverty and Jack Kelley, directors. The organization was started but little more than a year ago, has over 600 members, no obligations, and over \$1,000 in the treasury.

In recognition of 25 years of service with the Boston Woven Hose & Rubber Co., a dinner was recently tendered to John E. Laffey, a department head, by officers of the company, department heads and other business friends. He was presented with a gold watch and chain as a token of esteem from his associates.

* * *

In the United States District Court Judge Morton has appointed John E. Eaton and Louis A. Frothingham receivers of the Columbia Rubber Co., upon a petition filed by Stoneman, Gould & Stoneman. The bonds were fixed at \$9,500. Mr. Eaton was suggested by David Stoneman as a result of agreement of attorneys representing various creditors. Mr. Frothingham was the choice of Judge Morton.

* * *

The Peerless Rubber Co., which has been represented in Boston by the Enterprise Rubber Co. and later by the United States Rubber Co., will open its own branch store in this city

about the middle of February. It will also take the agency for New England of the Mechanical Rubber Co., of Cleveland. R. J. Barker, formerly with the Enterprise and United States companies, will be manager of the new branch.

W. E. Barker, manager of sales of the United States Rubber Co., addressed the members of the National Association of Shoe Wholesalers, at its luncheon incident to its annual meeting and election, at the Copley Plaza Hotel on Friday, January 14.

Francis H. Appleton, of the rubber reclaiming firm bearing his name, will spend the month of February at Miami, Florida.

Mr. Alexander, formerly in the efficiency department of the Tyer Rubber Co., Andover, Massachusetts, has resigned from that position to accept a similar one with the Apsley Rubber Co., Hudson, Massachusetts, where he will make a thorough investigation into costs of production, methods of manufacture, and plan for greater efficiency throughout the factory.

The Tyer Rubber Co. reports a steadily increasing demand for its new soling material, "Leatherex." One particularly striking advertisement shows a picture of a sportsman on skis "leaping into popularity," the skis being represented as exaggerated specimens of "Leatherex" soles, with the trade-mark on the bottom.

Howard B. Clifford, who for several years was in the Boston office of the United States Rubber Co., was married on Christmas day at St. Paul's church in Malden to Miss Iola G. Smith. He has been transferred to the Minneapolis, Minnesota, branch of the company.

The Kelly-Springfield Tire Co. is now located in its new branch and service station at 698 Beacon street.

Edward F. Bragg, of the Alfred Hale Rubber Co., who has been confined to his home by a long period of illness, is said to contemplate retiring from the treasurership of that company in the interest of his health.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE rubber factories throughout Rhode Island are so busy that the usual annual January vacations were passed and present indications are that it will be some time before any of the plants will be closed down excepting for necessary overhauling and repairing. One of the greatest drawbacks that the concerns are experiencing is the decided shortage of help which is becoming so serious that some superintendents are considering what they are going to do to keep pace with the demanded production. There is an exceedingly heavy call for all kinds of rubber goods that is constantly increasing.

Business has increased to such an extent at the several manufacturing plants at West Barrington, including the International Rubber Co., that enlarged railroad facilities have become necessary. Recently the New York, New Haven & Hartford Railroad, in response to the request of these concerns, lengthened sidings at the West Barrington freight yard several hundred feet, to admit of improved loading and unloading facilities. Now the increased output makes further extensions obligatory.

The Revere Rubber Co. has recently completed the installation of a Boland automatic sand blast at its plant on Valley street, Providence, by H. J. Astle & Co. This piece of machinery was specially designed for the Revere company and it is to be used for sand blasting steel automobile truck rims, making them perfectly smooth so as not to cut the rubber tires. The new machine, which removes the rust and imperfections from the rims more quickly than was formerly done, is double, each side being fitted with a spool to take the different sizes of rims. The rims

are revolved in order that every portion of the face may come into contact with the blowing sand, which operation is done entirely within the machine.

Although this sand blast has been in operation but a short time, the Dunlop Rubber Co., Limited, of Birmingham, England, has placed orders for a number of similar machines, the first shipment of which was made about the middle of the past month. Other shipments are to be made later to several of the Dunlop factories throughout Europe. These sand blast machines are 14 feet long by 4 feet wide and 8 feet high. A Boland four-cylinder blower is used to supply the blast to each machine.

The factory of the National India Rubber Co., at Bristol, did not have the usual January shut-down this year on account of the pressure of business. The plant was recently closed from Friday afternoon until the following Monday morning, during which necessary repairs were made to machinery. During the past few weeks considerable new machinery has been installed, including stitching, eyelet and stenciling machines.

Several hours are taken up each night in making up freight trains of rubber goods at the yards of the New York, New Haven & Hartford Railroad.

Colonel Samuel P. Colt, president of the United States Rubber Co., who reached his sixty-fourth birthday on January 10, entertained a few friends at his home, Linden place, Bristol, that evening in honor of the event.

Theodore Wood, for the past two years agent of the American Yarn Co., at Pawtucket, has removed to Akron, Ohio, where he has accepted a position as head of the textile department of The B. F. Goodrich Co. Before coming to Pawtucket he was an official at the Dartmouth Mills, New Bedford, Massachusetts.

Jefferson F. Galvin, for several years foreman of the calendaring department at the National India Rubber Co., Bristol, but now engaged in a responsible position with a rubber concern in Watertown, Massachusetts, is at his old home in Bristol, convalescing from a serious illness.

The Hill & Lacrosse Co., manufacturer of elastic webbing materials, Howard, because of increasing orders, is erecting a one-story addition to its plant. The new structure is 83 feet in length by 27 feet wide.

The Co-operative Auto Supply Co. has removed from 134 to 166 Washington street, corner of Empire street, Providence, where they are specializing in Racine tires.

The Republic Tire agency, Frank Glover, proprietor, formerly located on Washington street, has moved to larger quarters in the new building, 165 Empire street, Providence.

A contract has been given for a lounging and rest room to be fitted up at the plant of the Phillips Insulated Wire Co., Pawtucket.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

TIRE and accessory manufacturers are deeply interested in the automobile show to be held in the Trenton armory some time in the month of February. Arrangements will be made with automobile dealers in a number of surrounding counties to co-operate in making the show a success. R. V. Kuser is chairman of the committee in charge of the preparations. In this connection it may be interesting to state that there are more than 90,000 motor cars in use in New Jersey, of which about 79,000 are passenger cars and about 11,000 are trucks.

Work has been begun on a three-story tire-making wing for the Ajax Rubber Co., Inc., which will be 250 x 350 feet in size, with foundations built to hold additional stories. Rapid progress is being made on the additions to the vulcanizing works. A new

power house, with stacks, boilers, engines and dynamo units is to be erected, and equipment for the new rubber mill is now being built. By early spring it is expected that all the buildings will be completed, thus increasing the daily capacity to 5,000 tires.

The new inner tube department of the Essex Rubber Co., which has placed on the market three styles of automobile inner tubes, blue, red and gray, is said to be meeting with much success, as the demand for the goods is steadily growing.

The Eagle Rubber Cement Co. has been acquired by the Essex, and the cement is now made at the Essex plant. Adolph Biller, former head of the Eagle company, is directing the manufacturing of this cement at the Essex factory. The cement is one item in the line of automobile accessories which the company will push this season.

The Mercer Rubber Co. is erecting a large water tank to supply its recently installed automatic sprinkler system. This tank, which will be 125 feet high, will hold 80,000 gallons of water. About \$15,000 is being expended in installing the system.

The automatic sprinkler system of the Vulcanized Rubber Co., at Morrisville, probably saved that plant from a bad fire recently. The blaze started from an unknown cause in the carpenter shop, and the prompt operation of the sprinklers extinguished it before anyone learned there had been a fire.

The Lake Ruth Manufacturing Co., at Spotswood, making a line of druggists' sundries, lost its plant by fire January 5. Crossed electric light wires are said to have started the blaze. Dr. J. G. Donelsbeck, of Trenton, is one of the principal stockholders in the company, which, it is said, was rushed with orders. No announcement as to the rebuilding of the plant has yet been made.

The Mecca Tire Co. has begun operations in its newly acquired plant on Mulberry street. Goods are now being turned out in a limited way, but the installation of additional machinery will shortly enable the firm to greatly increase its output.

The Thermoid Rubber Co. began night work this week. The plant is unusually rushed with orders, and prospects for the coming season are considered most encouraging.

During the last month, since the evangelist arrived in Trenton, practically all of the rubber factories have had "Billy" Sunday services at the noon hour, which has generally been extended for the purpose.

The claim of Mrs. T. A. Foley for damages under the New Jersey Workmen's Compensation Law for the death of her husband, an employee of the Home Rubber Co., who lost his life on the "Lusitania" while on his way to the London office of the company, was dismissed by Judge Marshall in the Mercer county court. Mrs. Foley is making a further effort to obtain damages from the company, and the matter will probably be tried at the February term of the Supreme Court.

General C. Edward Murray, of the Empire Rubber & Tire Co., has been named by the Trenton Chamber of Commerce as a member of a special committee to consider the proposed establishment of a commission to work in conjunction with the permanent tariff commission.

Clifford H. Oakley, president of the Essex Rubber Co., is enjoying a vacation in Cuba.

Alfred Whitehead, secretary of the Whitehead Bros. Rubber Co., has been chosen a director of the Trenton Banking Co., to

take the place of the late William S. Hancock, who, it will be recalled, was also identified with the rubber business.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

AKRON is suffering from a severe case of "growing pains." The city limits have been extended. Real estate activity is unprecedented. Building cannot keep pace with the demand for houses occasioned by the arrival of factory workmen and their families anxious to share in the opportunities afforded by the mammoth industrial expansion now in progress.

It is reported that the Firestone Tire & Rubber Co. is interested in the half-million dollar Coventry Land & Improvement Co. recently incorporated, Robert F. Todd and John F. Rowe, of the general offices of the Firestone company being among the incorporators. It is expected that the two tracts of land owned by the rubber company, which would provide building lots for 600 homes, will be developed in a manner similar to the plan of Goodyear Heights, for the benefit of the Firestone employees.

The rim plant of the Firestone company is being enlarged by the addition of a building 50 x 100 feet in size, and some remarkable figures are presented with reference to the company's business in demountable rims. During December 4,000,000 pounds of special steel were used for rims, supplied on contracts with 79 car manufacturers. It is stated that present orders and production facilities assure an output of 1,000,000 demountable rims during 1916.

The books of The B. F. Goodrich Co. have just been closed for the purpose of compiling the full annual report for the year 1915. The results are as follows, subject only to the verification of public accountants and auditors:

After making proper provision for maintenance charges, depreciation, bad debts, and other items which it was deemed wise to take out of the year's earnings, the net profits for the period amount to approximately \$12,200,000.

This amount, added to the surplus carried over as of December 31, 1914, of \$3,100,000, shows undivided profits of approximately \$10,500,000 after deducting the four quarterly dividends of 1¼ per cent. on preferred stock outstanding, together with a provision of \$1,100,000 for the redemption of preferred stock, and a further amount of \$1,700,000 set aside for various reserves which will be shown in detail in the annual report.

The company's financial position has again improved during the past year, as the amount of quick assets over current liabilities shows a gain of approximately \$8,100,000.

The current assets amount to approximately \$31,250,000, and the current liabilities to \$4,200,000.

At the regular quarterly meeting of the directors held on January 26 a dividend of 3½ per cent. was declared on the preferred stock, payable 1¼ per cent. April 1 and 1¼ per cent. July 1. A quarterly dividend of 1 per cent. was declared on the common stock, payable February 15, 1916.

The directors voted to retire 7,000 shares of preferred stock prior to July 1, 1916. This makes a total retirement of 27,000 shares covering the charter provision for retirement of preferred stock up to July 1, 1916.

While the directors are highly gratified over the results of 1915, they have taken into consideration that a part of the increased earnings for the year were due to causes which may not be permanent.

One contributing factor was the large increase in volume of sales compared with those of 1914, with the result that the overhead expenses consumed a smaller percentage of the gross earnings than could reasonably be expected under normal operating conditions from year to year.

In addition to this, purchases of crude materials during the past year were rather more fortunate than usual.

These conditions may or may not prevail in the future and the directors are not disposed to base the dividend policy of the company upon results that might prove to be temporary in character.

While the company has done its share of the so-called war business, the total amount exported direct and through customers has probably not exceeded 5 per cent. of the total gross business of the year.

A new garage is being built by the Goodrich company, 169 x 315 feet in size, and six stories high. Hugh elevators will be installed, making possible the use of the first two floors as a garage both for company and employees, who own over 600 automobiles, valued at about \$600,000. The upper stories of the garage will be used as service stations and workshops.

The boot and shoe salesmen of the Goodrich company held their annual convention at the Akron plant during the last few days of December. Nearly 200 were present.

The Goodrich company has issued a public challenge, declaring itself willing to throw open its books and records to an independent audit company in order to prove that it manufactures more auto and truck tires combined than any other concern in America.

The new Diamond tires are made of "Velvet-Rubber," a recently developed rubber composition for which exceptional qualities are claimed.

The annual meeting of the Portage Rubber Co., Barberton, Ohio, was held on January 4, at 10:30 a. m., followed by a luncheon for the stockholders that was served in a recently completed addition to the plant.

By vote of the stockholders the number of directors was reduced from ten to eight, and the following directors were elected for 1916: James Christy, M. S. Long, W. W. Wildman, John Kerch, J. D. Raw, Fred H. Snyder, Dr. O. S. Welty and David Reed. The directors elected as officers, James Christy, president; M. S. Long, vice-president; W. J. Anderson, secretary, and W. W. Wildman, treasurer and general manager. A quarterly dividend of 1 3/4 per cent. was declared on the common stock. Following is the condensed statement of the company, covering the period from December 1, 1914, to December 1, 1915:

ASSETS.

Cash on hand and in banks.....	\$60,184.56
Notes receivable.....	43,940.25
Accounts receivable.....	206,756.69
Stock on hand (raw and finished).....	284,842.36
Real estate, buildings and machinery.....	337,979.97
Trade-marks, patents and good will.....	496,000.00
All other assets.....	15,536.76
	\$1,445,240.46

LIABILITIES.

Accounts payable, trade and notes due.....	\$10,506.57
Reserve fund (depreciation).....	6,992.77
Capital stock (preferred).....	750,000.00
Capital stock (common).....	500,000.00
Surplus.....	177,441.12
	\$1,445,240.46
Total sales for year 1915.....	\$1,067,858.30
Total sales for year 1914.....	661,848.53
Increase in volume 1915 over 1914.....	61.3%
Total profits for year 1915.....	129,065.76
Total profits for year 1914.....	88,102.13
Increase per cent. of profit.....	46.4%

Since this statement was made the item of trade-marks, patents and good will has been reduced to \$396,000 by taking \$100,000 from the surplus.

The Goodyear Tire & Rubber Co. has established a plan of retirement awards by which provision is made for stated monthly payments for life to men employees who have reached the age of 70, and women who have reached 65. There is also a condition under which old employees may retire, with awards, under the age limits mentioned. A group insurance plan has been in-

augurated, which allows an insurance policy for \$1,000, free of all cost, to any employee who is or becomes a member of the Goodyear Relief Association, a Goodyear institution of long standing which provides sick and disability insurance.

In order to keep up with orders, it is necessary for the Goodyear factory to work every hour of the day and night. The problem of night work has been met by introducing a six-hour shift and a bonus system for the special force of men who are to work during the hardest part of the night, from midnight to six a. m. This force will work permanently at night, and in return will gain a bonus of 40 per cent. of the amount earned in the six hours of labor.

A unique feature of the Goodyear factory is a large tire-finishing room where the sound of a human voice is rarely heard. The 60 men in this department—said to be the only one of its kind in the city—are all deaf-mutes, and it has been found that they are more skillful in lines of work that require keen sight and quick observation than men who can voice their speech.

The carriage tire department and the fire truck department of the Goodyear company have been combined under one head and placed in charge of F. H. Sawyer, who has had charge of the fire truck department.

The Adamson Machine Co. will manufacture practically all of the machinery and equipment to be installed in the new plant of the Gillette Safety Tire Co., Eau Claire, Wisconsin.

The Miller Rubber Co. is to add to its plant an eight-story building, 110 x 175, and a three-story building, 80 x 135 feet, construction of which will begin in the spring. Facilities for the company's manufacture of toy balloons have been increased.

Stockholders of the Miller company have been offered the right to subscribe to \$500,000 worth of stock in the company to the extent of 50 per cent. of their holdings. This stock has been held as treasury stock and is now to be sold.

The addition to the plant of the Star Rubber Co. mentioned last month will comprise a three-story building 70 x 100 feet. This company has been making automobile sundries and is now to begin the manufacture of tires.

The Mohawk Rubber Co. has doubled its capital stock, which is now \$500,000.

The first official meeting of the McLean Tire and Rubber Co., Cleveland, Ohio, was held on January 22. The following officers were elected: John C. McLean, president; W. B. Davis, vice-president, and T. J. Holmden, secretary and treasurer. This organization has purchased the building and equipment of the Morgan & Marshall Rubber & Tire Co., East Liverpool, Ohio, and will commence operating the plant early in February.

The Keystone Rubber Manufacturing Co., Inc., Erie, Pennsylvania, is making the "Keystone Universal" inner tube, in black with a red reinforced rim strip adapted for either 30 x 3 or 30 x 3 1/2-inch Ford tires.

The Aluminum Flake Co., with offices in the Ohio Building, Akron, Ohio, has recently completed its new factory on East High street, Barberton, Ohio. The building is 76 x 96 feet. A new drying process and a line of up-to-date machinery have recently been installed.

The General Rubber Manufacturing Co., mentioned last month, has changed its name to the General Tire & Rubber Co., and is now making tires and tubes at the daily rate of 400 and 1,000, respectively, as well as a large output of tire accessories.

F. A. Seiberling, president of the Goodyear Tire & Rubber

Co., was one of the 11 men, nationally prominent, who were chosen directors of the World Court League, with the object of ending of war through arbitration.

Ralph Upson, head of the balloon department of the Goodyear company, sailed for Europe on January 18, officially representing the Ohio National Guard as special observer of military aeronautics.

Walter W. Price, who is connected with The B. F. Goodrich Co., has been appointed a national deputy, with rank of major, on the staff of General H. Oden Lake, national commander of the Army and Navy League.

John Herron is now associated with the Akron office of Henderson & Korn, assisting H. H. Henderson.

H. A. Price, formerly with The B. F. Goodrich Co., and the Kelly-Springfield Tire Co., has been appointed sales manager of the tire division of the Rubber Products Co., Barberton, Ohio.

H. T. Keating, representing W. R. Grace & Co., dealers in crude rubber, New York City, has recently opened an office in Akron.

W. Armour Johnston, Jr., until recently in charge of rubber manufacture at the Staten Island factory of the S. S. White Dental Manufacturing Co., has accepted a position with the Miller Rubber Co., Akron, Ohio.

WESTERN TRADE NOTES.

THE accompanying illustration shows the plant of the Dry Climate Tire Manufacturing Co., Arvada, Colorado, mentioned in the November, 1915, issue of THE INDIA RUBBER WORLD. At a recent meeting of the directors, E. A. Austin, of Boulder, was chosen president in place of C. W. Clark, resigned; A. L. Davis, of Arvada, vice-president, and W. H. Davis, of Fort Lupton, secretary and assistant treasurer. John F. White, of

less, who has been in charge of the San Francisco territory, is now manager of the northern district, including Oregon, Washington, Idaho and Wyoming. C. O. Mars has been given full charge of the central district, comprising all the territory in California lying north of Bakersfield, and R. L. Sargeant is promoted to the head of the southern district, which comprises the remainder of California and Arizona.

Silas H. Jenkins has become the Western manager of the New York Mackintosh Clothing Co. Mr. Jenkins will make his headquarters in the Lytton Building, Chicago, Illinois. Besides directing the sales force in the Western territory, he will personally cover the Central West, Southwest, Northwest and Pacific Coast. Mr. Jenkins is widely known throughout this territory and the South, where he has a host of friends who will no doubt help to make his new position a profitable one.



SILAS H. JENKINS.

Irwin Reed, formerly manager of the Los Angeles branch of the Republic Rubber Co., Youngstown, Ohio, has been appointed president of the Republic Rubber Co. of California.

Tom Wilkenson, formerly Los Angeles manager for the United States Tire Co., New York City, has been made manager of the San Francisco branch, which is the Pacific Coast headquarters of the company, and also controls the Hawaiian and Oriental trade. H. A. Farr, who has been with the United States Tire Co. for many years, will assume managership of the Los Angeles branch.

MOLDED OR FORMED INSULATION SECTION.

The Molded or Formed Insulations Section of the Associated Manufacturers of Electrical Supplies was organized on December 8, 1915, with the following officers: E. B. Hatch, Johns-Pratt Co., Hartford, Connecticut, chairman; R. W. Seabury, Boonton Rubber Manufacturing Co., Boonton, New Jersey, secretary, and Joseph Steinberger, General Insulate Co., Brooklyn, New York, treasurer.

Standing committees were appointed with the following chairmen:

Molded Rubber Insulation: Philip H. Campbell, American Hard Rubber Co.

Fibre Insulation: E. M. Grant, American Vulcanized Fibre Co.

Suspension and Third Rail Insulation: Louis Steinberger, Electroose Manufacturing Co.

High-Heat Molded Insulation: J. G. Miles, Westinghouse Electric & Manufacturing Co.

Molded Composition Insulation: C. F. Siemon, Siemon Hard Rubber Co.

Miscellaneous Insulation: H. S. May, General Bakelite Co.

At a meeting held on January 12 at the Biltmore, the following subcommittee on Molded Rubber Insulation was appointed: R. W. Seabury, Boonton Rubber Manufacturing Co., Boonton, New Jersey; McConnell Shank, The B. F. Goodrich Co., Akron, Ohio; and C. D. Wilson, Luzerne Rubber Co., Trenton, New Jersey.



FACTORY OF DRY CLIMATE TIRE MANUFACTURING CO.

the First State Bank of Arvada, is treasurer, and William J. Kreuder factory manager.

The Federal Rubber Manufacturing Co., Cudahy, Wisconsin, has opened a direct factory branch in Seattle, Washington, at 1921 Fifth avenue. F. B. Bloom, well known in the tire business on the Pacific Coast, is in charge of the branch.

B. H. Pratt, known through the Pacific Coast territory as factory representative for the Fisk Rubber Co., Chicopee Falls, Massachusetts, has been elected vice-president and general manager of the Federal Rubber Manufacturing Co., Cudahy, Wisconsin, whose recent acquisition by the Fisk company was noted in the January issue of THE INDIA RUBBER WORLD. D. E. Bay-

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

THE rise in price of rubber to 4s. per pound is naturally a topic of much discussion in trade circles, though one does not hear so much about rigging the market as was the case when the advance commenced. Shortage of the commodity in hand and uncertainty as to the further effect of enemy submarines have led to a rush of buying orders from manufacturers, not only in this country, but also from America and Europe.

No figures are available as to the amount of rubber lost at sea, no details having appeared in the press, and it is quite possible that the amounts referred to in trade circles are exaggerated.

So far the rise in price of raw rubber has not been reflected in the scrap and reclaimed markets or only to a trifling extent. Of course the reclaimers are not grumbling at the altered state of affairs, which will certainly lead to increased business.

Though there has naturally been some increased activity in plantation shares in the market, it has not amounted to anything like a boom and very little speculation is being indulged in by those who at one time were always discussing the subject. Extra taxation has limited the amount of money available for investment and then there is the excess profits tax on the companies to check fabulous dividends.

Naturally, with the advent of conscription, though in a somewhat modified form compared with continental countries, the labor question tends to become more acute. The local tribunals will shortly have to decide which particular employees of rubber works are indispensable for the business, and their verdicts are being awaited with considerable interest.

No doubt we shall shortly have a general increase in the price of rubber goods, but at the time of writing the only notification I have to this effect is from The B. F. Goodrich Co., Limited, of London, announcing that owing to the general increase in costs they are reluctantly compelled to make a 10 per cent. advance on all mechanical, druggists' and cycle sundries from January 1.

The greatly increased cost of freight across the Atlantic must of course affect the American business, and will act as a set off to our increased cost of labor and coal.

The case of the Daimler Co., Limited, against the Continental Tyre & Rubber Co. (Great Britain), Limited, is to be heard before the House of Lords shortly. The divisional court and the appeal court have held that the Continental is a British company with corresponding rights, despite the fact that all the directors and practically all the shareholders are enemy aliens, and it is sought to have this decision upset. Considerable interest is taken in the case within and without rubber circles.

Many notices have appeared in the press regarding synthetic rubber in Germany. From what I can gather the position is much what it was three or four years ago when motor tires were made of it—at a cost.

The Bayer company is reported to be spending £100,000 on a plant for the manufacture, but it is difficult to conceive how this can pay when the natural product is again available in bulk. The case is on the same lines as cracking petroleum for toluol. This can be and is being done to supply a shortage, but at a cost which would be entirely prohibitive except in war time. Still, with regard to synthetic rubber, one cannot but acknowledge the great discoveries which have been made by German chemists in various fields, and the war is undoubtedly proving a spur to greater activity in the laboratory.

OILSKINS.

One of the latest developments is the trench stocking, which is retailed at 4s. 11d. the pair, obviously for use at the front. It

comes into direct competition with last year's novelty, the trench stocking made of thin waterproofed cloth similar to fishing stocking material and intended to be worn in conjunction with woolen socks and leather boots.

Regarding oilskin stockings, it may be interesting to note that the experimental work as to their suitability has been done by Professor Delepine, of the Public Health Laboratory, Manchester University, the experiments in the manufacture of the goods being carried out by Messrs. Storey, of Lancaster, the original makers of oil baizes for table use.

It will be interesting to see how the oilskin competes in practice with the more expensive rubber. Oilskin hats and hat covers for ladies have come into favor recently.

INDUSTRIAL POISONS IN RUBBER MANUFACTURE.

The communication under this heading in the December issue of THE INDIA RUBBER WORLD has been read with much interest.

All said and done the rubber worker who takes any care of himself and is intelligently supervised has only one real enemy, and that is carbon disulphide. It is satisfactory to find that its very insidious and malevolent nature is now recognized in all civilized countries and its use is mostly under government control through the medium of factory acts. Very different was the state of affairs at the distant period which my memory can recall when the only precautions taken had reference to danger from fire and not to the employees' health.

The cold curing of waterproof cloth having been largely superseded by the dry-heat process, has left the dipping room, where small articles were cold cured, the main theatre for reform, and I must say that the present conditions in works I have visited in Britain and in Germany show a vast improvement on those of the "bad old days."

The American report refers to the danger of carbon tetrachloride. In this case the toxic effect did not come into notice in England until a lady of position died from the effects of its application in a hairdressers' establishment, the result being an inquiry and special regulation. Much the same may be said of the new solvent tetrachlorethane, which after two or three deaths of workmen has now been declared to be much more dangerous than chloroform.

These cases seem to suggest that a more humanitarian method of procedure would be to have new chemicals for manufacturing processes officially examined for toxic properties before they are passed for use instead of waiting for inquests. I am all the more inclined toward this opinion on account of a suggestion in THE INDIA RUBBER WORLD that now is the time for the inventive mind to bring forth new compounding ingredients for the rubber trade to replace those which the war has rendered either unprocureable or unsuited to the modest purse.

Returning to the report it is stated that the two most dangerous poisons are encountered in the acid or cold cure and in the vapor cure. This is modified by saying that the sulphur chloride itself is not really dangerous, being merely an irritant. This then should absolve the vapor cure—where the chloride is vaporized by heat and not by mineral acid—because carbon disulphide is not used in the vapor cure as evolved and practised in this country.

NEWS PARAGRAPHS.

An explosion of naphtha vapor occurred on a foggy morning in December at the proofing works of Lindsay & Williams, Limited, Manchester, whereby one man was killed and another seriously injured. At the inquest the jury found that the ex-

plosion was caused by the contact of naphtha fumes from the solution vessels with naked gas jets, and recommended that all lights, whether electric or gas, be enclosed by globes and that naked lights should be prohibited.

Mr. Morton, of the laboratory staff of Pirelli & Co.'s new cable works at Southampton, has accepted an appointment at Birmingham with the Dunlop Rubber Co., Limited.

J. W. Shaw, of the Paragon Rubber Manufacturing Co., Hull, is now director and works manager of the Pomona Rubber Co., Limited, Manchester.

The British Foreign Office has reported that out of 300 bags of parcels post mail seized on the steamship "Hellig Olav," 109 bags contained nothing but crude rubber. The estimated weight of the rubber seized was 8,000 pounds.

The Goodyear Tyre & Rubber Co., Limited, London, has recently opened a sales branch in Dublin, to take care of its increasing trade in Ireland.

OBITUARY NOTES.

The position of commercial manager at the works of the Leyland & Birmingham Rubber Co., Limited, Leyland, vacant by the death in active service of Lieutenant-Colonel Fallows, has been filled by the appointment of Mr. Pratt, late with G. MacLellan & Co., Glasgow.

Kenneth Pelmore, whose death at the early age of thirty years I regret to record, was better known to the rubber trade as Kurt Pfeleider of the well-known Peterborough firm specializing in rubber-washing machines.

Lieutenant Walter Wild, late of the Wood Milne, Limited, has suffered a severe bereavement in the death at the Dardanelles of his son, Trooper John Wild, of the North Auckland Mounted Rifles, New Zealand expeditionary force.

THE DUNLOP RUBBER CO., LIMITED, REPORT.

The Dunlop Rubber Co., Limited, reports net profits for its last fiscal year of £411,639, making, with £33,241 brought forward, a total of £444,880 [\$2,165,013]. After paying dividends on the preference and ordinary shares and writing off £175,000 [\$851,637] on real estate, plants and equipment, the net balance of £75,528 [\$367,557] is carried forward to this year's account.

To insure a constant and uniform supply of the best cotton fabrics the company has entered into arrangements whereby spinning and weaving mills of the most modern construction, operating nearly 50,000 spindles and 200 heavy looms, have been built at Rochdale, near Manchester, England, on the purchase of which the company has an option.

The directors expressed the opinion that the outlay for the new establishment at Bromford, to cost about £330,000 [\$1,605,945], and the purchase of the cotton goods mills, with the expenses entailed by the excess-profits tax law and the redemption of the balance of the parent tire debentures, can be accomplished without the issue of new capital or affecting dividends, but recommended that they should be given that power to increase the authorized preference capital from £800,000 to £1,000,000.

TRADE NOTES FROM SCANDINAVIA.

SWEDEN.

THE Liljeholms Hamppspinnerei och Kabelfabrik, Liljeholmen, manufacturers of insulated wire and cables, has recently increased the salaries of its employees 10 per cent.

A new tire and general rubber goods repairing company has been incorporated in Gothenburg, under the name of Göteborgs Gummireparationsverkstad, Einar Lundström.

Victor Anderson, owner of a large belt, packing and general rubber mechanical goods business in Malmö, died recently, aged forty-three years. The business, which was founded by Mr.

Anderson in 1902, will be continued under his name at 4 Jörgen Kocksgatan, Malmö.

The Trelleborgs Gummifabriks Aktiebolag, Trelleborg, engaged chiefly in the manufacture of rubber tires, has increased its capital stock from 300,000 to 800,000 crowns [\$80,400 to \$214,400].

O. Nelson, formerly of the Hartford Rubber Works Co., Hartford, Connecticut, has been appointed factory manager of the Gislaveds Gummifabriks Aktiebolag, manufacturer of automobile tires, Gislaved.

A serious fire recently destroyed more than \$30,000 worth of crude rubber and other materials of the Viskafoss Rubber Works, Viskafoss.

NORWAY.

The Norwegian Government is spending 100,000 crowns [\$26,800] in erecting and equipping an aeroplane factory with a shop large enough to assemble four machines simultaneously.

A circular issued by the government, dated November 12, 1915, places an embargo on all exports of woolen or cotton rubberized fabrics and also on garments made of these fabrics.

Aktieselskabet Skandinaviske Kabel og Gummifabriker, a new company planning to manufacture cables and general rubber goods, was recently incorporated in Christiania with 1,200,000 crowns [\$321,600] capital stock.

DENMARK.

During the year 1913, Denmark imported \$112,947 worth of crude rubber from France. Since the outbreak of the war this trade has entirely ceased.

Aktieselskabet DeForede Gummi og Lufttrinfabriker, Copenhagen, recently declared a 25 per cent dividend. This company's production of automobile tires has been increased from 25 to 60 tires per day in spite of the many difficulties that have been experienced in obtaining sufficient quantities of crude rubber and other raw materials. Dr. Alfred Benyon has been elected president of the company.

Through the joint efforts of the Danish "Landbank" and the British Ambassador at Copenhagen, the Copenhagen Auto Cab Co. has obtained a large consignment of tire casings and inner tubes.

Aktieselskabet Unmack & Pedersen, Aalborg, wholesale dealers in transmission belts, packings and mechanical rubber goods, have increased their capital stock from 140,000 to 200,000 crowns [\$37,520 to \$53,600].

SMUGGLING RUBBER INTO GERMANY FROM HOLLAND.

The smuggling of rubber from the Netherlands into Germany has become a profitable business, according to a report printed in a Paris paper. On account of the high prices obtainable in Germany much rubber has been sent there, the Dutch consumer being compelled to do without.

The government of the Netherlands, in striving to maintain strict neutrality, requires owners of automobiles desiring new tires to turn in their old ones, regardless of how damaged and dilapidated they may be, in order to prevent them being sent to Germany.

It is said that much smuggling is being indulged in, although smugglers, when apprehended, are subject to a fine of 16 florins [\$6.43] per pound. It is intimated that the Germans are glad to pay a price that makes rubber smuggling profitable, even if the smuggler is occasionally apprehended.

Weisse & Co., large importers and dealers in crude rubber and gutta percha in Rotterdam and Amsterdam, Holland, have announced that M. J. Overeynder has withdrawn from the firm and has been succeeded by Mr. F. A. F. De Gruyter, who has been granted power of attorney at the Amsterdam branch.

The Rubber Trade in Germany.

By Our Regular Correspondent.

THE opening up of the route through the Balkans to Turkey and the Orient eclipses all late events in its importance to our commerce and industry. Our industries are suffering from lack of orders as much as from lack of raw materials and the clearing of the road to the Orient will enable us to obtain not only the needed raw materials but will permit us to reach a market for the sale of our manufactured products. The importance of the event escapes no one and this explains the joyous celebrations that marked the announcement of our latest victories.

Before our troops had cleared the way our Balkan Association was organizing and by the time this letter reaches you we will again be trading with the Orient. Our rubber industry, closely allied as it is with other industries, will be able to supply practically all demands and will therefore participate in this prosperity.

Our rubber manufacturers can only produce a limited number of articles from crude rubber, but they are able to make almost anything in "war qualities," that is to say, in qualities containing no crude rubber, but only reclaimed and substitute stock mixed with the necessary fillers and vulcanizing ingredients. Though not as elastic and durable as standard quality rubber goods, these "war qualities," under the circumstances, are satisfactory substitutes that answer the purposes for which they are used.

Some articles cannot be made in "war qualities." Surgeons' gloves, for instance, must contain pure rubber, because no substitute will stand the high heat necessary in sterilizing. "War quality" jar rings recently caused large quantities of preserves to become useless by letting air into the containers. All this is unfortunate but the fact remains that our rubber manufacturers are producing thousands of serviceable articles which, without their intelligence and initiative, would not be available at all.

COMMERCIAL EXPANSION PLANS.

Of late various commercial and industrial organizations have been holding meetings to discuss developments of great importance. The Commercial Treaty Association, which represents practically all the commercial and industrial interests of the empire and has for its object the advising of the government in making commercial treaties, met on November 26 in Berlin. The action taken was not made public and, therefore, cannot be reported. All that may be said is that the commercial concessions to be exacted from our enemies were discussed at length and that the association has sent confidential representatives to Russian Poland, Holland, Turkey, the United States, Argentina, Uruguay, the Far East, and other places of commercial importance. Their duties are strictly commercial in character and involve nothing political or military.

Other meetings of less importance were held by the Union of German Bicycle Manufacturers and by the Association of German Cycle & Motor Vehicle Dealers.

Automobile and automobile tire interests here and in Austria-Hungary are giving much attention to the possible danger of an American motor car invasion following the war. It has been seriously suggested that German and Austro-Hungarian automobile and tire manufacturers combine together to produce a standard model motor car to compete in price as well as in quality with anything America can produce.

Our manufacturers recognize that quantity production is the secret of American low-priced automobiles and that, to compete, they must find means for following the "American system."

CHRISTMAS PREPARATIONS.

We are now preparing for our second "war Christmas." Most of the gifts went to the men at the front. The majority were useful presents, among which, judging from show windows, rub-

ber goods were prominent. Many of our large stores had elaborate window displays of "Christmas in the Trenches." Rubber goods were much in evidence. Garments, footwear, ground cloths, cushions, tobacco pouches, sponges, sponge bags, folding wash basins and bath tubs, combs, etc., all in "war qualities" of rubber are shown as desirable presents.

One war novelty attracting much attention is a combination of elastic bands and an elastic fabric cap, all impregnated with powerful chemicals. These are known as "vermin guards," and are intended to be worn next to the skin to prevent vermin entering underneath the clothing and scattering over the body of the wearer. Soldiers say that these "guards" are much more practical and more effective than the powders and salves heretofore used for the same purposes.

TRADE NOTES.

Edward Pohlman, of Varel, Oldenburg, has founded a transmission belt factory to be known as the North German Transmission Belt Works.

The North German Cable Works, Neukölln, reports 10 per cent. profits.

The B. Pollack Co., rubber manufacturer, Walterhausen, has declared a 6 per cent. dividend.

The German Cable Works, Alt-Boxhagen, near Berlin, reports a satisfactory year and has declared a 6 per cent. dividend.

The Humboldt Machine Works, Cologne-Kalk, recently held its annual meeting of shareholders at which 9,813,000 marks (\$2,335,494) capital was represented. A 7 per cent. dividend was declared and ordered paid immediately.

The Imperial Chancellor has ordered the sequestration of the property of the Alsatian Rubber Goods Manufacturing Co., Steinbach, Alsace.

PERSONALS.

Dr. Konrad Delbrück, formerly collaborator of Dr. Hoffmann, at the Bayer Chemical Works, Elberfeld, well known for his work relating to the production of synthetic rubber and the production of acetone by direct refining, has been killed at the front. He was 31 years old and just previous to the war had erected for the Bayer company a large acetone distilling plant.

The iron cross for bravery was recently awarded to Captain of Reserves Osterwald, manager Excelsior Rubber Works, Hanover, who is now at the front.

NOTES FROM AUSTRIA-HUNGARY.

The proposed increase of 25 per cent. in domestic postal rates is being bitterly opposed by manufacturers and traders through their organizations.

The latest reports from Vienna tell that many bankruptcies are occurring among cycle manufacturers and dealers.

Hugo Goldschmidt and Marcel Herzeg, directors of the Semperit Austro-American Rubber Works, have organized a new company at Vienna, the Sembusto Elastic Tire Co., which will not conflict with the Semperit company.

The Hungarian Rubber Goods Manufacturing Co. recently issued new stock, which increases its capital from 4,500,000 to 6,000,000 crowns (\$913,500 to \$1,218,000). The new stock has been offered to the present shareholders.

The Japanese are now extending their planting activities in the Ulu Selangor district. Y. Hasegawa, of Kuala Kubu, has recently acquired a large acreage in Ampang Pechah Mukim with a view to planting rubber.

Rubber Planting Notes.

FRENCH INDO-CHINA RUBBER PLANTATIONS AFFECTED BY WAR MEASURES.

FRENCH INDO-CHINA is one of the latest on the list of plantation rubber-producing countries, and it is only in the last few years that attention has been given to the creation of modern plantations. The first rubber from this colony was obtained from wild plants, mostly of the vine variety. In the second half of 1913, when the crash came in rubber prices, most of the French Indo-China *Hevea* plantations were merely in course of creation. Many had just finished planting.

Coming at this stage, the crisis made it very difficult for these non-producing plantations to obtain credit and, in view of the slump in rubber values, very little money could be raised by the sale of stock of companies that would not produce for a number of years to come. All the estimates of future income and future profits on crops were discredited by the general depreciation of the market value of crude rubber. In the face of these difficulties the Indo-Chinese planters and plantation companies applied to the French Bank of Indo-China for loans to enable them to insure the upkeep of their property until the trees would come into bearing. The French colonial laws authorize banks, under governmental supervision, to loan money on future crops, but it was discovered that the provisions of the laws did not cover rubber crops that would not be available for a number of years. Consequently it was decided to obtain long-date loans that could be repaid in annuities, to begin at a date when the plantations would be in bearing. Arrangements were made on this basis and, as the government's sanction was essential, it was requested to give consent. This was early in 1914, and the government has not as yet given any definite reply.

Serious conditions have developed; lack of funds has caused the plantations to be seriously neglected; trees that now could be tapped for small quantities of latex are not touched because tapping would be unprofitable at present prices. Many plantations have been obliged to discharge their entire staff. The moratorium resulting from the war in Europe has stopped the periodical remittances that were coming forward from the sale of shares and from small loans obtained in France. To complete the havoc, the French government has prohibited all exports of rubber to other than French ports, thus closing to Indo-Chinese rubber its principal market, Singapore. This embargo is causing much discontent among the planters who, apart from resenting this reflection on their honor and patriotism, believe that the British Government has taken adequate measures to prevent rubber reaching the enemies of the Allies, and, therefore, it is unnecessary to bar Indo-Chinese rubber from the Singapore market.

A new Governor-General has recently been appointed to Indo-China, and hopes of relief are renewed. Should the government continue to ignore the plantation interests, a very serious condition is likely to develop.

PLANTATION RUBBER IN GERMAN WEST AFRICA.

The cultivation of rubber in German West Africa began about 15 years ago with plantings of *Funtumia Elastica*, the indigenous rubber tree. *Hevea* was not introduced until 1907, when seed was obtained from the East. By 1911, about 25,000 acres were planted in rubber, this area being divided equally between *Funtumia* and *Hevea*. Since 1911 *Funtumia* has been steadily losing favor as a plantation tree, chiefly on account of its poor yield in latex as compared with *Hevea*.

No new plantings have been recently made and, as the trees become exhausted, they are cut out and *Hevea* is planted instead. The latter demands less from the soil than *Funtumia*, yields more rubber, and is better suited for interplanting with cocoa.

Lack of seed and other planting material as well as lack of labor and the sowing of the seed in abnormally wet weather have retarded the development of *Hevea* plantings.

It is stated that both *Funtumia* and *Hevea* on German West African plantations suffer from a species of root disease and that in addition to this the *Funtumia* has to contend with "stag beetles"; however, the principal difficulty on these plantations has always been labor.

Hevea was first tapped in the season 1912-13. The exports of plantation rubber from German West Africa have been comparatively small, though increasing steadily, as shown by the following figures: 1909, 5,922 pounds; 1910, 5,795 pounds; 1911, 23,912 pounds; 1912, 53,040 pounds.

The forests of German West Africa produced good qualities of wild rubber, but this production has been on the decline for a number of years and is now practically a thing of the past.

THE RUBBER INDUSTRY OF ANGOLA. PORTUGUESE WEST AFRICA.

Angola, the largest of Portugal's African possessions, a rubber producing country of comparatively great importance 20 years ago, is today affected by a similar crisis as the Congo, Brazil and other countries producing wild rubber.

At times rubber has formed as high as 75 per cent. of the total value of Angolan exports. In 1910, the shipments of rubber amounted to 2,438 tons and were valued at \$6,007,200; in 1911, 1,968 tons, value \$2,972,400; in 1912, 2,188 tons, value \$3,470,000; in 1913, 1,489 tons, value \$1,993,905; and in 1914, 1,336 tons, value \$725,206.

The primitive methods employed by the natives in gathering, cleaning and drying the rubber resulted in the product arriving on the European markets in poor condition. However, owing to the great demand, Angolan qualities still obtained profitable prices until quantities of clean plantation rubber made their appearance.

Angolan rubber comes mostly from the remote interior of the Benguela district, where it is obtained by the natives from vines; *Landolphia Kirkii*, *Landolphia florida*, etc.; and is sold at the trading stations which buyers have established in many parts of the Benguela plateau.

Recently an Englishman has established a modern rubber cleaning plant at Bihé which will probably lead to an improvement in Angolan wild rubber qualities.

As to plantation rubber, the friable soil of Angola and the rainfall, are very favorable to *Manihot*, two varieties of which have been successfully cultivated at an altitude of from 2,500 to 3,000 feet. On December 31, 1914, *Manihot* plantation rubber was selling at 2s. 7d. per kilogram [29 cents per pound] in the Benguela market.

HEVEA RUBBER YIELDS IN SOUTH INDIA.

The *Hevea* plantations in South India have been producing for the past six years, but, compared with Ceylon and Malaya, the yields in dry rubber per acre have never been very satisfactory, due apparently to climatic conditions.

Of late, however, an experienced planter has openly taken the view that the climate is not wholly to blame and that it should not be made the scapegoat for past sins and mistakes of planters who have failed to adapt the proper methods of cultivation and tapping to the climatic conditions.

In the early days of rubber planting in South India most of the planters had no practical knowledge of the task they were undertaking and overtopping was much indulged in, so that to-day many trees must be allowed to rest until damaged bark is renewed by nature. This process of bark renewal in many cases

takes seven years, so bad is the state of the overtopped trees. Another cause of the comparatively low yields per acre is the overcrowded state of many plantings. It is not unusual to find as many as 200 trees to the acre in spite of the fact that estates, thinned down to 105 trees have produced more rubber than the overcrowded ones.

The opinion is advanced that future yields would be materially increased were tapping operations stopped each year from June 15 to the middle of August—during the southwest monsoon—when fully 50 per cent of the annual rainfall occurs. During this wet, windy season the trees experience a second leaf-fall quite distinct from the regular seasonal leaf-fall, which occurs in the early part of the year. However, the trees do not shed all their foliage as in the regular wintering season. Some are more affected than others; one may be almost totally denuded while its neighbor will retain its foliage.

Several theories have been advanced to explain this occurrence. Some believe it to be due to disease; others hold that it is a physiological response of the tree to climatic conditions.

REVIEW OF RUBBER CULTIVATION IN NETHERLANDS EAST INDIA.

SOUTHEAST ASIA and Netherlands East India were the only producers of cultivated *Ficus* rubber previous to 1900.

The first attempts to plant rubber trees in Java were made with *Ficus elastica*, and thereafter with other kinds, including *Hevea Brasiliensis*, *Castilloa elastica* and various *Manihot* species. The cultivation of the latter species attained considerable importance, but compared with *Hevea* these varieties are given small attention.

It was not until 1905 that the cultivation of rubber was undertaken to any great extent in Netherlands East India. From that

diseases, by proper precautionary measures. Leaf diseases, however, have not proven to be of as malignant a character as in other colonies.

The important problem of tree planting distances has been settled by adopting a more open spacing than formerly and interplanting with catch crops of *Robusta* coffee. The usual planting distances for *Hevea Brasiliensis* in recently opened plantations have been increased to 18 x 18, 20 x 20, or 12 x 24 feet apart.

At the beginning of 1913 the planted acreage of *Hevea* in Netherlands East India was as follows:

	In Java.	In the possessions beyond Java.	Total.
<i>Hevea</i>	63,387	168,151	331,538
<i>Hevea</i> interplanted	12,578	33,086	45,664
Total	193,175	222,137	415,312

In addition to the above 1,000,000 *Hevea* trees are to be found distributed on estates in the whole colony.

The *Hevea* is considered tappable when $\frac{3}{4}$ to 4 years old, but in Java the trees are sometimes not tappable before their fifth year.

The preferred method of tapping young trees is a V incision covering half the circumference of the stem. The stems of older trees are tapped by quarters on the "Half Herringbone system." The tapping process of each quarter is extended to $\frac{1}{4}$ to $\frac{1}{2}$ years, thus requiring 5 or 6 years to tap the full circumference of the stem.

Plantation labor expense has greatly increased, due to shortage of laborers, but in comparison with other rubber producing centers, the cost of labor in Netherlands East India is not excessive.

The following statistics show the exports of *Hevea* rubber from Java and the East Coast of Sumatra during 1912 and 1913:

	Java.		East Coast Sumatra.	
	1912.	1913.	1912.	1913.
Holland	7,857	1,006	35	484
United Kingdom	255	1,000	102	759
Elsewhere	37	339	1,125	1,893
Totals	486	2,345	1,322	3,036

*Tons of 2,200 pounds.

In regard to the other possessions of the Archipelago, the total exports of those islands in 1912 were 536 tons of 2,200 pounds.

EXTENT OF PLANTING AREA.

In Java the area planted with rubber cannot be extended, because of topographical and climatological circumstances and the fact that only small plots of suitable land are now available. In Sumatra, however, the area for the cultivation of *Hevea* could easily be extended to even three times the present space. The same can also be said of Borneo.

The area and exports of *Ficus elastica*, *Castilloa* and *Manihot Glaziovii* rubber are practically negligible.

GUTTA PERCHA.

Gutta percha is only to be found in East Asia. In Netherlands East India it grows in the Rhio Archipelago, in Banka, Borneo, Sumatra and in New Guinea, besides a few other islands. The product is principally obtained from the *Palaquium* species. The bulk of the product is from wild trees, which are felled for the purpose of tapping.

To prevent the extinction of the *Palaquium* species plantations have been opened up in Netherlands East India since 1885, namely, the Government Gutta Percha Plantations at Tjipetir, where practically only trees of this species are grown.

The exports of plantation produced gutta percha from Java totaled 6 tons in 1912 and 25 tons in 1913.

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."



LATEX FACTORY AND CARRIERS IN THE FAR EAST.

date the investments in this branch of agricultural industry gradually increased, and numerous plantations were opened up where rubber was cultivated on a large scale.

HEVEA BRASILIENSIS

Starting in a small way in 1876, experiments were made in propagating this tree, and in Java and Sumatra an opportunity was afforded to gather data respecting growth, etc., which have been of great assistance in cultivation later undertaken on an extensive scale.

The acclimatization of *Hevea* in Netherlands East India has been entirely successful. The trees look very healthy and the growth appears to be satisfactory.

It has been found possible to reduce parasitic root and stem

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED DECEMBER 14, 1915.

- N**o. 1,163,591. Rubber-backed wheel rim. W. F. Stearns, Evanson, Ill.
- 1,163,732. Bath apparatus. J. T. Barlow, Oak Park, Ill.
- 1,163,736. Rim for vehicle wheels. R. S. Bryant, assignor to The Standard Welding Co.—both of Cleveland, Ohio.
- 1,163,805. Bottle closure. F. R. Bonn and B. D. Hamill—both of Salt Lake City, Utah.
- 1,163,835. Bed net fastener. A. R. Logan and M. A. J. Barille—both of Chelmsford, Mass.
- 1,163,908. Air bag. R. T. Griffith, assignor to Miller Rubber Co.—both of Akron, Ohio.
- 1,163,927. Valve stem. G. Hughes and D. F. Givens—both of Syracuse, N. Y.
- 1,163,938. Horseshoe pad. J. H. Matchett, Oakland, Cal.
- 1,163,993. Hard rubber plug for storage battery. B. Ford, Philadelphia, Pa.
- 1,163,995. Hose coupling. G. P. Frank, Roselle, N. J.
- 1,164,157. Fountain pen. S. Zollinger, Woodhaven, N. Y.
- 1,164,177. Heel pad. H. M. Eaton, Hudson, Mass.
- 1,164,190. Pneumatic tire. H. Jancovich, Pittsburgh, Pa.
- 1,164,214. Anti-skid device. E. S. Roberts, Yonkers, N. Y., assignor to Kelly-Springfield Tire Co., Jersey City, N. J.
- 1,164,219. Insect guard with rubber center. F. J. Rush, New York, N. Y.
- 1,164,279. Anti-skid device. W. Grus, Jr., assignor to Grus Leaf Spring Oiler Co.—both of Chicago, Ill.
- 1,164,303. Laminated tube of rubber and fabric. E. S. Nicewarner, Chicago, Ill.
- 1,164,304. Laminated tube of rubber and fabric. E. S. Nicewarner, Chicago, Ill.
- 1,164,312. Life saving garment. W. R. Pike and T. S. Morton—both of Tuxedo Park, N. Y.
- 1,164,316. Arch support. F. Roehn, assignor to The Scholl Manufacturing Co.—both of Chicago, Ill.
- 1,164,521. Protective covering for cable or hose. O. P. Houben, Akron, Ohio.
- 1,164,545. Protective tire covering. A. J. Moonen, Denver, Colo.
- 1,164,554. Vehicle wheel. T. C. Shepherd, Jr., Joliet, Ill.

ISSUED DECEMBER 21, 1915.

- 1,164,642. Garment. V. Guinzburg, assignor to The I. B. Kleinert Rubber Co.—both of New York, N. Y.
- 1,164,654. Fountain pen. G. M. Kraker, assignor to Kraker Pen Co.—both of Kansas City, Mo.
- 1,164,834. Pneumatic tire casing. J. A. MacMillan, Dayton, Ohio.
- 1,164,928. Elastic arm band. C. F. Corcoran, Williston, N. D.
- 1,164,946. Solid tire. R. L. Lynch, Campbellsville, Ky.
- 1,164,963. Demountable tire and rim. M. C. Shweinhart, West Hoboken, N. J.
- 1,164,970. Sanitary semi-skirt. L. Winn, Chicago, Ill.
- 1,164,985. Golf practicing device. C. S. Britton, Cleveland, Ohio.
- 1,165,045. Dress form combining an outer elastic envelope and inflatable sacs. C. A. Offord, Boston, Mass.
- 1,165,052. Rubber cushion and buffer. W. J. Williams, La Grange, and J. C. Bowman, Chicago—both in Illinois.
- 1,165,057. Tire inflating device. T. Bayly, assignor of one-half to D. Alford—both of Clearwater, Fla.
- 1,165,094. Demountable rim. C. C. Harbridge, Chicago, Ill., assignor to Detroit Demountable Rim Co., Detroit, Mich.
- 1,165,095. Demountable rim. C. C. Harbridge, assignor to Detroit Demountable Rim Co.—both of Detroit, Mich.
- 1,165,096. Demountable rim. C. C. Harbridge, assignor to Detroit Demountable Rim Co.—both of Detroit, Mich.
- 1,165,145. Cushion tire comprising a collapsible wearing shoe. F. V. Uebzi, assignor to Transcontinental Wheel Co.—both of New York, N. Y.
- 1,165,153. Tire chain. L. W. Claska, Garden Valley, Idaho.
- 1,165,216. Rubber covered club. E. E. Wefen, Christiansburg, Norway.
- 1,165,235. Rubber heel. E. J. Emery, Portsmouth, N. H.
- 1,165,275. Anti-colic nurser. M. Montgomery, Mankato, Minn.
- 1,165,282. Automotive tire inflater. J. H. Pearson, Indianapolis, Ind., assignor of one-third to W. O. Jackson, and one-third to J. U. Baughman.
- 1,165,283. Handle for air brake coupling. C. M. Petrey, Oxford, N. C.
- 1,165,322. Blow-out patch. M. Copps and A. B. Crewdson, Charter Oak, Iowa.

ISSUED DECEMBER 28, 1915.

- 1,165,390. Rim for solid tires. W. E. Copithorne, Natick, Mass.
- 1,165,398. Cushion tire. M. Dickerson, assignor of one-half to F. L. Luz—both of Newark, N. J.
- 1,165,449. Tubular collapsible diaphragm for hose couplings. E. W. Rietz, assignor to Chicago Car Heating Co.—both of Chicago, Ill.
- 1,165,464. Hose clamp. F. C. Stuckel, assignor to Universal Fastening Co.—both of St. Louis, Mo.
- 1,165,484. Rubber grip for handles. W. E. Zimmerman, Owosso, Mich.

- 1,165,486. Packing for rods and the like. R. Allen, Caversham, England.
- 1,165,512. Resilient tire. T. N. Jordan, Long Beach, Miss.
- 1,165,533. Sanitary apron. C. G. Nelson, Pittsburgh, Pa.
- 1,165,576. Vehicle tire. H. Dech, assignor to Eureka Tire Co.—both of Trenton, N. J.
- 1,165,577. Vehicle tire. H. Dech, assignor to Eureka Tire Co.—both of Trenton, N. J.
- 1,165,630. Pneumatic tire casing. E. C. Seward, Jr., New York, N. Y., assignor to Eureka Tire Co., Trenton, N. J.
- 1,165,631. Pneumatic tire casing. E. C. Seward, Jr., New York, N. Y., assignor to Eureka Tire Co., Trenton, N. J.
- 1,165,687. Inversole. C. B. Mansbach, assignor of one-half to F. L. Price—both of Brockton, Mass.
- 1,165,780. Transmission belting. K. W. Jappe, Brooklyn, N. Y.
- 1,165,810. Demountable wheel rim. Q. L. Sparks, Stamping Ground, Ky.
- 1,165,845. Resilient vehicle tire. J. Cairns, Hove, Brighton, England.
- 1,165,847. Rubber heel cushion. C. E. Cashman, Fitchburg, Mass.
- 1,165,876. Pressure indicator for pneumatic tires. W. E. Heberling, Youngstown, assignor of one-fourth to G. Goodman, Struthers—both in Ohio.
- 1,165,888. Armored tire. W. F. Macklin, Appleton, Wis.
- 1,165,926. Tire and inner tube. I. J. Webster, Haverhill, Mass., assignor to Reliance A. C. Co., Inc., New York, N. Y.
- 1,166,043. Remountable rim. S. J. Dobzynski, Cuyahoga Falls, Ohio.
- 1,166,059. Repair coupling for air hose. R. W. Ledbetter, Birmingham, Ala.
- 1,166,065. Cushion tire. A. M. Livelsberger, Kalamazoo, Mich., assignor of one-half to A. Bair, Tiffin, Ohio.
- 1,166,152. Telephone receiver. T. Rhodus, Chicago, Ill., assignor to The Magnaphone Co., a corporation of Arizona.
- 1,166,158. Hose clamp. C. A. Simmons, Albany, N. Y.
- 1,166,223. Hose coupling for fire hydrants. G. W. Killin, Huntington, W. Va.
- 1,166,248. Internal heel cushion. J. Patten, New York, N. Y.
- 1,166,314. Cushion tire. C. L. Beckham and H. C. Beckham—both of Toledo, Ohio.
- 1,166,338. Urethric syringe. G. J. Duggan, assignor to Beckton, Dickinson & Co.—both of Rutherford, N. J.
- 1,166,368. Puncture proof tire. J. H. Harvey, Scranton, Pa.
- 1,166,374. Sprinkling device. G. E. Jackson, assignor of one-fourth to J. W. Jackson, both of Springfield, and one-fourth to F. C. Jackson, Akron—all in Ohio.
- 1,166,406. Nursing bottle. R. R. Baker, assignor to H. H. Baker—both of Buffalo, N. Y.
- 1,166,407. Air brake hose coupling. W. E. Benn, McAdam Junction, New Brunswick, Canada.
- 1,166,416. Cushion wheel. G. W. Smith, assignor to The Elastic Wheel Co.—both of Baltimore, Md.

ISSUED JANUARY 4, 1916.

- 1,166,478. Suspender. E. E. Peck, Hugo, Okla.
- 1,166,548. Cushion wheel. H. J. Sewell, Highland Park, Mich.
- 1,166,622. Road-out patch. E. H. Morehouse, Culver City, Cal.
- 1,166,662. Nozzle for syringes. R. B. Crump, Hoboken, N. J., and J. Bernstein, New York, N. Y.; said Bernstein assignor to said Crump.
- 1,166,741. Dimpled fountain pen. A. Brochetti and J. Familiet—both of Dunkirk, N. Y.
- 1,166,761. Medicine container with bulb. A. C. Higgins, assignor to H. K. Mulford Co.—both of Philadelphia, Pa.
- 1,166,811. Rubber mat. W. F. Bowers, San Francisco, Cal.
- 1,166,861. Pneumatic tire armor. F. W. Simons, Vallejo, Cal.
- 1,166,862. Rubber powder flask. S. B. Smoot, Dimmock, assignor of one-half to W. E. Decans, Mount Hope—both in West Virginia.
- 1,166,863. Fountain pen. H. Stein, Vienna, Austria-Hungary.
- 1,166,946. Croquet mallet having a core and filaments of rubber wound thereon. I. Taylor, Jr., Hubbard Woods, Ill.
- 1,166,972. Vehicle wheel rim. B. Darrow, assignor to The Goodyear Tire & Rubber Co.—both of Akron, Ohio.
- 1,166,984. Surgical bandage. E. Gulacski, Youngstown, Ohio.
- 1,166,990. Wheel rim for pneumatic tires. F. P. Johnson, Danville, Pa.
- 1,167,062. Dental saliva ejector. F. Groshans, Baltimore, Md.
- 1,167,103. Heel pad for shoes. M. J. Nolan, Chicago, Ill.
- 1,167,113. Flash reducing garment. T. W. Rogers, Columbus, Ohio.
- 1,167,196. Pencil holder. C. B. Mercer, North Pittston, Pa.
- 1,167,210. Rotary shaft or rod packing. S. Orr, Tarpon Springs, Fla.
- 1,167,226. Garter. L. M. Spano, Columbus, Miss.
- 1,167,236. Apparatus for promoting the growth of hair. L. J. Widness, New York, N. Y.
- 1,167,306. Receptacle closure. C. R. Keeran, Bloomington, Ill.

ISSUED JANUARY 11, 1916.

- 1,167,497. Collapsible bucket. F. C. Hayes, Altamont, N. Y.
- 1,167,596. Metal chain tread tire. A. Rich, Stamford, Conn.
- 1,167,669. Hose supporter. R. E. Ward, Kansas City, Mo.
- 1,167,836. Mileage indicator for tires. A. C. Pratt, Glen Ridge, N. J.
- 1,167,849. Infant's folding bath tub. M. C. Sherman, Ben Avon, Pa.

ISSUED DECEMBER 21, 1915.

- 88,953. Foster Rubber Co., Kennebunk, Me., and Boston, Mass. Picture of a cat. For rubber heels, boots and slippers.
- 88,954. Foster Rubber Co., Kennebunk, Me., and Boston, Mass. Picture of a cat. For rubber heels.
- 88,955. Foster Rubber Co., Kennebunk, Me., and Boston, Mass. The words *Low Price Rubber Shoes*. For rubber heels.
- 89,935. Vaughan Rubber Co., Detroit, Mich. Illustration of a heel with the words *R. P. P.* For rubber heels.
- 90,696. National Hoof Pad Co., Brooklyn, N. Y. The word *Pic.* For rubber pads for horse boots.
- 90,188. National India Rubber Co., Bristol, R. I. The word *Emmy-Lou*. For rubber and canvas shoes, boots and slippers.
- 90,189. National India Rubber Co., Bristol, R. I. The words *Sister Sue*. For rubber and canvas boots, shoes and slippers.
- 90,497. Bishop Gutta-Percha Co., New York, N. Y. Illustration of an Indian's head. For backing cloth, sometimes called plumping cloth.
- 90,546. Simplex Wire & Cable Co., Boston, Mass. The word *Fibrex*. For electric wire and cables, insulated wire and woven covered wire and cables for electrical use.
- 90,947. W. F. Mayo & Co., Boston, Mass. The word *Whip*. For rubber and rubber and canvas boots and shoes.

ISSUED DECEMBER 28, 1915.

- 90,657. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Lura*. For light weight rubber shoes.
- 90,658. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Okey*. For rubber shoes.

ISSUED JANUARY 4, 1916.

- 73,390. Bourn Rubber Co., Providence, R. I. Representation of the bottom of a shoe. For rubber boots and shoes.
- 81,938. The Gordon Rubber Co., Canton, Ohio. Representation of a triangle. For rubber tubes and tires.
- 82,130. C. A. Daniel, Philadelphia, Pa. Illustration of a diamond design with the words *Daniel's Ebonite* in white letters on a black background. For rubber machinery packing.
- 89,444. E. T. Packard, Avon, Mass. Illustration of two shells. For rubber heels.
- 89,734. Lambertville Rubber Co., Lambertville, N. J. The word *Redskin*. For rubber boots and shoes.
- 90,176. W. H. Horn & Bro., Inc., Philadelphia, Pa. Illustration of a diamond design. For trusses, supporters, surgical belts, elastic stockings, etc.
- 90,332. Harris & Berntz Co., Philadelphia, Pa. The words *Prevents Colic* in red letters on a black background. For nursing bottle nipples.
- 90,344. McFadden Bros., Wheeling, W. Va. Pictures of three little boys holding a plate with the words *Three Brothers*. For shoes and boots of leather and rubber, rubberized and oiled waterproof clothing, etc.
- 90,410. The Goodyear's Metallic Rubber Shoe Co., Naugatuck, Conn. The word *Unicks*. For leeching rings, rubber bead softeners and rubber complexion cloths.
- 90,412. The Goodyear's Metallic Rubber Shoe Co., Naugatuck, Conn. The word *Naughyde*. For foot balls and basket balls.

ISSUED JANUARY 11, 1916.

- 90,157. Spottles Co., Inc., Richmond, Va. The word *Spottles*. For rubber roofing.
- 90,549. Abercrombie & Fitch Co., New York, N. Y. The initials *A F & Co.* For tents, ground cloths and rubber blankets, etc.
- 90,960. Standard Underground Cable Co., Pittsburgh, Pa. Illustration of a cable. For electric cables.

ISSUED JANUARY 18, 1916.

- 87,178. Wright & Ditson, Boston, Mass. Illustration of a man standing on a ball with a tennis racket in his hands. For golf and tennis balls and sporting goods.
- 88,812. A. V. Osterhout, Port Washington, N. Y. The word *Everywoman's*. For ladies' shoes of leather, rubber, etc.
- 90,165. Automobile Tire Co., Inc., New York, N. Y. The word *Nomad*. For rubber pneumatic automobile tires and tubes.

DESIGNS.

ISSUED DECEMBER 21, 1915.

- 48,341. Auto pedal pad. J. Winkler, assignor to Auto Pedal Pad Co.—both of New York, N. Y.

ISSUED DECEMBER 28, 1915.

- 48,348. Vehicle tire. H. G. Ellis, assignor to Hood Rubber Co.—both of Watertown, Mass.

ISSUED JANUARY 4, 1916.

- 48,374. Tire. G. W. Greene, assignor to Ten Brock Tyre Co.—both of Louisville, Ky.

ISSUED JANUARY 11, 1916.

- 48,437. Miner's shoe. J. T. Crowley, Beacon Falls, Conn., assignor to The Beacon Falls Rubber Shoe Co., a corporation of Massachusetts.
- 48,438. Miner's shoe. J. T. Crowley, Beacon Falls, Conn., assignor to The Beacon Falls Rubber Shoe Co., a corporation of Massachusetts.

ISSUED JANUARY 18, 1916.

- 48,473. Elastic fabric. C. A. Lapworth, West Bridgewater, assignor to The Lapworth Webbing Co., Duxton—both in Massachusetts.

THE RUBBER SCRAP MARKET.

THE sensational advance in the price of crude rubber has promptly reflected in the January rubber scrap market and prices developed substantial gains in the entire list. The break in crude rubber prices that occurred early in the month will doubtless be followed by a reaction in shoddy and values will eventually decline in sympathy with the crude material.

The scarcity of all grades of stock has been a dominating feature of the market that is generally conceded to be of the dealer's making, and the mills have refused to buy largely at the higher level now prevailing.

Boots and shoes lead the activity that began about the middle of the month and prices sought new levels supported by the prevailing "bullish" sentiment. Quotations were firm at 10½¢@11 cents and few sales reported, due to the unsettled conditions; however, several orders were taken at 11½¢.

Auto tires advanced strongly with G and G tires leading. Sales were reported at 8½¢. However, quotations were made at figures close to 9 cents for mill delivery.

Under advancing prices inner tubes developed a speculative following that supported the market firmly at 29 to 30 cents for No. 1 tubes.

Later in the month the market experienced an unsettled feeling, attributed to the recent break in crude prices, and in consequence there was less speculative buying. Consumers came forward about this time for supplies of boots and shoes and sales were made at 11½¢ cents delivered.

The market for tires continued to be active, but prices in certain grades had shown considerable weakness. During the last week G and G tires were selling for 8½¢ cents and standard white tires were weak at 6½¢ cents.

In mechanical scrap there has been little change other than the price advances recorded in the following list.

NEW YORK QUOTATIONS FOR CARLOAD LOTS DELIVERED.

January 29, 1916.

	Per Pound.
Boots and shoes	\$0.11½¢ @ .11½¢
Trimmed articles	.09 @ .09½
White tires, Goodrich and Goodyear	.08¾¢ @ .09
Auto tires, standard white	.06½¢ @
Auto tires, standard mixed	.06½¢ @
stripped, unguaranteed	.04 @
Auto peelings, No. 1	.08 @ .10
No. 2	.08 @ .08½
Inner tubes, No. 1	.29 @ .30
No. 2	.12½¢ @ .13
red	.14½¢ @ .14½¢
Irony tires	.01½¢ @ .02½
Bicycle tires	.03¾¢ @ .04
Solid tires	.03½¢ @
White scrap, No. 1	.13 @ .14
No. 2	.10 @ .11
Red scrap, No. 1	.09½¢ @ .10½
No. 2	.07½¢ @ .07¾
Mixed black scrap, No. 1	.03¾¢ @
No. 2	.03½¢ @
Rubber car springs	.03½¢ @
Horse shoe pads	.04½¢ @ .04½¢
Matting and packings	.01 @ .01½
Garden hose	.01½¢ @
Air brake hose	.05¾¢ @
Cotton fire hose	.02½¢ @
Large hose	.02½¢ @
Hard rubber scrap, No. 1, bright fracture	.24 @
Battery jars (red compound)	.02½¢ @
Insulated wire stripping	.02 @
rubber heels	.03½¢ @

A NEW BLOW-OUT PATCH.

A new inside blow-out patch, manufactured by the Polson Rubber Co., Kansas City, Missouri, encircles completely the tire tube and is fastened by a special self-adjusting strap. It is claimed that when the tube is inflated, the patch expands at its ends and tightens in its center, thus preventing pouching and the consequent enlargement of the hole in the casing. Such a patch can be used for rim cuts as well as for side blow-outs.

Crude Rubber During 1915.

THE crude rubber market for the year 1915 opened in a most unsatisfactory condition, with the British embargo in force and uncertainty existing as to whether the United States would be able to secure its necessary supply. In New York there were small stocks on hand. With prices steady and fewer buyers, the manufacturers kept out of the market for fear that any buying movement would force prices up, and a feeling of hopefulness existed that the negotiations to have the embargo lifted would result favorably.

The year began with First latex crêpe selling at 86 to 87 cents and Upriver fine at 75 cents a pound. On January 8 cabled information was received that rubber could be shipped to New York subject to special guarantees, and prices declined from then to the end of the month, when both First latex crêpe and Upriver fine were quoted at 60 to 61 cents a pound. The first crude rubber reaching New York after the lifting of the embargo was 200 tons that arrived on the "Lusitania" on January 23. At the end of the month much rubber was afloat, including 2,500 tons from England.

February opened with demand from manufacturers light, but with plantation rubber arriving regularly and with ample supplies in London to draw on. Shipments from Brazil were also coming in steadily. During March, delayed shipments, partially due to the London dock strike, tended to limit trading, and manufacturers were not attracted by the low price of Upriver fine, which had dropped to around 58 cents. The general impression prevailed that there was plenty of rubber for everybody and nobody seemed anxious to invest.

In May a lively interest developed and considerable business was done, owing largely to the desire of manufacturers to stock up in anticipation of possible political disturbances that might result in cutting off the supply. The buying movement, however, soon ceased. Although most rubber being imported was sold before it arrived, The Rubber Club of America, Inc., agreed to handle and release such shipments as might arrive unsold and to sign the usual guarantee.

During June, arrangements were completed by which plantation rubber might be shipped to any Atlantic port of the United States, consigned to the British consul, the usual form of guarantee being required and passed upon by the Rubber Club. Arrangements were also perfected by which shipments to Pacific ports could be consigned to the British consul at San Francisco and cleared in the same manner as those at Atlantic ports.

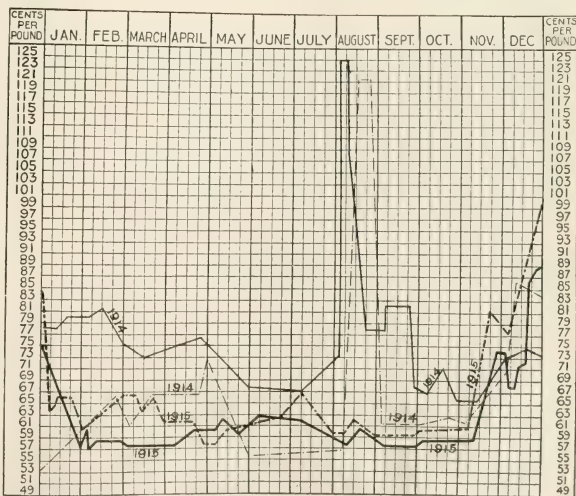
Prices had gradually advanced, with the ordinary fluctuations, until July opened with First latex crêpe at 63 cents and Upriver fine at 62½ to 63 cents. The market evidenced slowness in New York, but the price reflected the strong position of plantation in the London market. Beginning with August a general downward tendency manifested itself, due to plentiful supplies and

unstable conditions of foreign exchange, and on October 1, First latex crêpe was quoted at 59½ to 60 cents and Upriver fine at 56 to 57 cents a pound.

The most interesting movement commenced on November 6, when heavy buying in London was reported, and prices began to soar. On November 11 quotations were withdrawn, and on November 23, First latex crêpe and prime ribbed sold at 85 cents in a strong market and Upriver fine at 76 cents spot. Real buying was done at these advanced prices, which were generally credited with being influenced by the closing of the Suez and Panama canals and the submarine activity in the Mediterranean. During the last week of the month prices weakened considerably.

December, which will long be remembered for its spectacular rise in prices, opened with First latex crêpe at 75 cents and Upriver fine at 68 cents a pound. Before the month ended, the former advanced 25 cents and the latter 20 cents a pound. With prices steady and a strong market, rapid advance was made when cables brought the news of the sinking of the "Langton Hall" in the Mediterranean with 500 tons of rubber aboard. Encouraged by heavy buying in London, the upward price movement continued as the month progressed, higher prices being quoted almost daily. The news that two rubber ships had been routed around the Cape instead of by the Suez Canal encouraged the upward movement.

On the last day of the year the prediction of "dollar rubber" was realized, for First latex crêpe sold at that price, and Upriver fine at 87 and 88 cents a pound. The local December market has been characterized as a creation of dealers, but it is understood that manufacturers needed stock and bought at high prices.



Compiled by the Gould Commercial Co., New York.

1915. UPRIVER FINE.

FIRST LATEX CRÊPE.

1914. UPRIVER FINE

FIRST LATEX CRÊPE

Chart showing fluctuations in Para and Plantation rubber for two years—Spot prices.

SUMMARY OF NEW YORK RUBBER PRICES.

1915.	Upper		Islands		Cameria.
	Fine	Coarse	Fine	Coarse	
January	\$0.61@0.75	\$0.45@0.58	\$0.53@0.70	\$0.29@0.37	\$0.31@0.41
February	..57@.61	..45@.58	..50@.54	..29@.32	..30@.40
March	..58@.60	..45@.57	..51@.53	..30@.32	..34@.37
April	..57@.60	..46@.48	..52@.55	..30@.33	..33@.37
May	..59@.61	..45@.48	..52@.54	..30@.31	..32@.34
June	..61@.63	..45@.47	..52@.55	..29@.31	..31@.33
July	..59@.63	..44@.47	..52@.54	..28@.30	..31@.32
August	..56@.59	..42@.44	..50@.52	..27@.28	..29@.31
September	..55@.57	..41@.43	..49@.51	..26@.27	..28@.30
October	..55@.57	..42@.45	..50@.54	..26@.28	..28@.29
November	..57@.59	..44@.46	..54@.57	..27@.34	..29@.36
December	..68@.87	..57@.72	..65@.80	..32@.45	..35@.48

AVERAGE PRICES.

1915.....	\$0.61 ¹ / ₄	\$0.47 ³ / ₄	\$0.55 ¹ / ₂	\$0.30 ¹ / ₂	\$0.33 ¹ / ₄
1914.....	.73 ¹ / ₂	.47 ¹ / ₂	.63 ¹ / ₂	.31 ¹ / ₂	.35 ¹ / ₄
1913.....	.87 ¹ / ₂	.58	.79 ¹ / ₂	.36 ¹ / ₄	.42
1912.....	1.11 ¹ / ₄	.89 ¹ / ₂	1.05 ¹ / ₂	.59	.63 ³ / ₄
1911.....	1.18 ¹ / ₄	.95	1.10 ¹ / ₄	.64	.70 ¹ / ₂
1910.....	2.01 ¹ / ₄	1.36 ¹ / ₄	1.89 ¹ / ₄	.90	1.00

UNITED STATES AND CANADA CRUDE RUBBER STATISTICS FOR 1915.

Month.	Paris.	Imports.		Ex. ports.	Re- tained.
		Planta- tion.	Abso- lute.		
January	2,673	4,084	102	758	7,617
February	1,980	3,472	274	692	7,418
March	2,452	5,271	600	829	9,112
April	2,788	6,728	240	810	10,566
May	1,454	5,713	208	628	8,003
June	2,043	4,828	189	798	7,858
July	1,800	4,785	277	620	7,482
August	2,099	4,857	212	783	7,951
September	2,550	4,840	208	714	8,312
October	1,820	3,329	134	633	5,916
November	1,912	3,635	253	643	6,443
December	2,729	5,485	343	762	9,159
Totals	26,300	58,117	2,700	8,070	95,707

Compiled by Gould Commercial Co.

THE LONDON VIEW OF THE 1915 MARKET.

DURING the year that has just closed the use of rubber has increased beyond all expectations, due in large measure to the heavy demands for military purposes and to the large number of automobile tires turned out by American manufacturers.

The supply of crude rubber has increased about 22 per cent. over that of 1914, thus making the great gain in manufacturing possible. Estimates show that plantations now supply about two-thirds of the world's crude rubber. Of the year's production, as estimated by leading authorities, at between 144,750 and 147,000 tons, 98,000 tons, or about two-thirds of the total, came from the plantations. In 1914 the total production was 120,380 tons, of which 71,380 were plantation grades. Back in 1910, six years ago, the plantations yielded but 8,200 tons of the world's supply.

THE MARKET.

The year's market has been dominated largely by emergency regulations arising out of the unusual war conditions. The trade has been chiefly with the neutral countries and strict precautions have been taken to prevent the raw material from reaching the enemy.

Until the middle of September the market presented no features of striking interest. About that time, however, fear began to be felt that there might be a shortage of tonnage both from the East and to America. The situation of the canals also excited no small influence on conditions.

In December speculators who had oversold near delivery rubber, quickly covered their requirements in part and advanced prices 1s. per pound, 3s. 7 1/2d. being paid for pale crépe and 3s. 6 1/2d. for ribbed smoked sheet. After a rapid decline of 7d. per pound prices again were forced up to 4s. 1d. and 4s., many interested in sales being frightened about obtaining freighters for their rubber contracts.

Manufacturers and speculators bought freely for distant delivery and large sales for 1916 were made. The market closed

with crépe at 4s. 1d. and sheet at 4s., an advance on a year ago of 1s. 6d. to 1s. 9d. on spot and near. Pará, which is much less speculative, closed at 3s. 9d. for fine hard.

Estimates place £16,000,000 as the value of the enormous quantity of rubber that was shipped to the United States during 1915. This should serve as some indication of the abounding prosperity in America.

The following table shows the production of crude rubber for the last three years:

THE WORLD'S PRODUCTION.

	1915.	1914.	1913.
Ceylon and India	20,600	14,800	11,300
Malaya, etc.	72,800	49,700	36,200
Amazonas (Brazil, Bolivia and Peru)	30,700	28,345	29,380
Peruvian and Caucho	6,800	8,655	9,620
West Coast, Africa	2,500	2,650	3,900
Benguela and Messamedes	1,900	1,500	1,300
Loanda	600	450	400
Congo, French Congo and Soudan	3,000	3,900	4,400
From other sources	7,100	10,380	11,410
Totals	146,000	120,380	108,440

Wild rubber has decreased, although Brazil has sent an average supply. The Pará and Manaós markets were not controlled, as in some former years, and showed but little speculation. Prices have not been maintained relatively to plantation rubber, but the entire Brazilian supply has been readily taken by consumers. The following closing prices for recent years may be of interest:

	Hard	Negrohead	Negrohead	Caucho
	Fine Pará.	Scrappy.	Island.	Ball.
1913	3s. 11 1/2d.	2s. 6d.	1s. 5d.	1s. 11d.
1914	2s. 10 3/4d.	2s. 1 1/2d.	1s. 3d.	2s. 4d.
1915	3s. 9d.	2s. 10d.	1s. 7d.	3s.

The lowest price at which hard fine Pará was sold during 1915 was 2s. 4 1/2d. and the highest 3s. 9d.

The South American exports of medium grade have fallen off considerably. The supply of Caucho Ball shows a heavy decrease, with price relatively high. Bolivia sent a fair quantity; Mollendo and Venezuela, via Orinoco, very little, and Ceara and Manicoba rather less. Matto Grosso shipped a fair crop. The supply from Mexico was very small. Good qualities of West Coast African grades have sold well, but the yield shows decline. English and German East Africa sent but little.

PLANTATION RUBBER.

It is said that any planting which may have been done in 1915 has been fully counteracted by the falling out of cultivation and the thinning of some of the previously planted areas. The following estimate shows the acreage of the chief plantations from 1913 to 1915:

	1913.	1914.	1915.
Ceylon	220,000	220,000	235,000
Malaya, Malacca	300,000	500,000	550,000
Borneo	20,000	20,000	25,000
Dutch East Indies, Java, Sumatra, etc.	400,000	400,000	450,000
India and Burma	45,000	65,000	60,000
German colonies, Samoa, East and West Africa	60,000	40,000	25,000
Totals	1,245,000	1,245,000	1,345,000

The plantations, principally of Castilloa, in Mexico, West Indies and Central and South America have not progressed and have yielded insignificant supplies. India, Burma and the Mergui have increased and are extending, but the East African plantations of Ceara have sent but little.

The following table shows the annual receipts and shipments at Pará during the years 1913 to 1915:

	1913.	1914.	1915.
Receipts of Pará	24,750	28,170	30,595
Receipts of Peruvian	9,620	8,655	6,800
Shipments of Pará and Peruvian to Europe	22,119	15,985	14,440
Shipments of Pará and Peruvian to America	17,050	21,690	29,960

DISTRIBUTION.

The consumption of crude rubber of the various grades has been estimated as follows:

	1913.	1914.	1915.
England, <i>etc.</i>	18,000	18,000	24,000
Germany, Austria, <i>etc.</i>	16,600	16,430	3,000
France.....	9,000	5,000	7,000
Russia.....	11,500	11,601	16,000
Italy, <i>etc.</i>	1,370	4,000	2,500
Japan and Australia.....	2,000	2,400	4,000
America and Canada.....	47,200	62,940	89,500
Totals.....	105,670	120,380	146,000

It is interesting to note the great increase of the demands made by the United States, England, Russia, Japan and Australia and the great curtailment in the supply that went to the Teutonic nations.

[The figures and information used in the above review have been supplied by S. Figgis & Co., Gow, Wilson & Stanton, Limited, and W. H. Rickinson & Son, all of London.]

FEDERATED MALAY STATES RUBBER EXPORTS.

A calculation from the statement to the Malay States Information Agency gives the exports of plantation rubber from the Federated Malay States to the month of December as 5,111 tons, compared with 4,936 tons in November and 4,961 tons in the corresponding month last year.

Appended are the comparative statistics for three years:

	1913.	1914.	1915.
January.....	2,131	2,542	3,473
February.....	1,757	2,364	3,411
March.....	1,737	2,418	3,418
April.....	1,626	2,151	2,777
May.....	1,235	2,069	2,708
June.....	2,005	2,306	3,403
July.....	1,781	2,971	3,687
August.....	2,363	1,850	3,796
September.....	2,000	2,879	3,884
October.....	2,160	2,897	4,120
November.....	2,062	2,889	4,636
December.....	2,618	3,361	5,111
Totals.....	23,465	30,697	44,524

From these statistics it will be seen that December establishes a new record for monthly export, eclipsing the November export (the previous best) by no less than 475 tons and being only 341 tons below the total export for the year 1910. The total for the year is also a record, surpassing last year's total by 13,827 tons. For the sake of comparison it is interesting to note the aggregate exports for the same period from the Federated Malay States for the past seven years—1909, 2,641 tons; 1910, 5,452 tons; 1911, 8,792 tons; 1912, 15,506 tons; 1913, 23,465 tons; 1914, 30,697 tons; 1915, 44,524 tons.

EXPORTS OF INDIA RUBBER AND CAUCHO FROM PARÁ, MANAÓS, IQUITOS AND ITACOATIARA IN 1915, AND FOR EIGHTEEN YEARS.

[The figures indicate weights in kilograms.]

EXPORTERS.	NEW YORK.				EUROPE.				GRAND TOTAL.
	Fine.	Medium.	Coarse.	Caucho.	Fine.	Medium.	Coarse.	Caucho.	
J. Marquet.....	429,019	339,058	1,147,586	426,531	234,531	1,875,702	41,752	189,453	3,278,533
Suter & Co.....	893,797	133,437	875,742	393,448	2,966,344	46,340	28,596	17,660	3,448,466
Adelbert H. Alden, Limited.....	71,862	52,588	110,344	26,936	26,730	886,275	72,145	160,667	1,180,817
General Rubber Co. of Brazil.....	1,848,164	151,295	1,112,541	587,932	3,699,932	893,558	96,499	57,161	50,191
Fires Teixeira & Co.....	518,278	691	990,215	264,965	1,834,674	799,495	40,621	42,154	1,097,409
Zarges, Berringer & Co.....	271,879	14,574	34,187	72,970	39,610	.....	.....	.....	66,430
Selmann & Co.....	336,787	340	28,863	175,605	541,595	18,042	.....	.....	563,399
Suñez Hermanos & Co.....	706,827	6,661	105,181	109,778	928,447	9,000	.....	.....	714,566
Stowell Brothers.....	.....	2,550	1,320	156	4,026	209,569	15,559	47,940	263,610
G. Fratelli & Co.....	11,050	510	6,930	.....	18,490	.....	.....	.....	18,490
Sundries.....	662,688	35,122	308,818	226,400	1,033,037	17,088	.....	.....	36,420
Exports from Pará.....	786,826	477,322	2,284,730	1,344,444	5,570,063	337,675	476,757	5,605	7,618,775
Manaos.....	4,127,611	560,840	1,627,351	1,360,960	7,682,762	4,526,213	669,347	469,097	1,137,489
Iquitos.....	464,605	28,448	168,594	770,306	1,431,953	316,609	60,709	117,262	417,352
Itacoatiara.....	29,780	1,800	15,610	13,200	60,390	41,978	1,905	21,563	138,734
Totals.....	10,172,277	1,383,914	6,533,882	4,429,196	25,919,209	10,654,863	1,069,832	1,084,846	2,376,891
1914.....	9,972,494	1,677,762	5,645,917	4,389,925	25,698,098	9,071,232	1,114,999	1,461,862	2,385,981
1913.....	7,223,363	1,354,794	5,324,881	3,198,077	17,101,115	11,747,008	1,591,241	2,456,162	6,338,207
1912.....	9,477,888	2,035,278	6,503,631	3,271,621	21,354,488	12,570,242	1,414,872	5,200,397	22,007,905
1911.....	7,686,680	1,571,375	5,173,230	1,669,596	16,100,881	11,380,371	1,503,869	4,519,039	19,757,718
1910.....	5,800,410	1,412,311	4,489,108	1,658,661	15,060,490	11,673,302	1,506,752	3,382,432	6,146,842
1909.....	9,439,722	1,767,310	5,784,170	2,655,778	19,646,980	13,310,613	1,372,221	2,950,626	5,649,763
1908.....	8,280,768	1,739,505	5,616,549	1,902,620	17,539,442	10,721,266	1,419,025	2,854,624	5,528,994
1907.....	8,012,592	1,863,775	5,149,312	1,580,657	16,006,336	10,783,787	1,358,764	3,190,982	5,574,783
1906.....	7,406,171	1,785,315	5,496,419	1,331,399	16,192,304	9,289,310	1,253,574	3,223,944	4,799,623
1905.....	7,173,463	1,518,444	4,921,222	1,647,216	15,260,345	10,052,634	1,291,703	4,298,516	4,363,690
1904.....	6,062,104	1,630,355	5,394,429	1,222,580	16,309,468	7,915,817	993,955	2,503,520	3,221,376
1903.....	5,248,063	1,621,827	5,029,646	1,133,857	15,033,395	9,156,872	1,167,956	2,859,742	3,076,971
1902.....	5,688,524	1,644,776	5,423,413	1,133,155	13,859,868	8,322,521	1,514,521	2,595,177	2,027,222
1901.....	8,027,727	1,926,505	4,271,456	1,325,290	15,550,798	7,939,010	1,506,358	2,665,553	2,638,599
1900.....	6,557,277	1,199,611	3,783,279	894,500	12,344,667	7,991,397	1,401,390	2,556,969	1,857,100
1899.....	7,583,405	1,319,349	4,023,710	951,854	15,878,318	6,410,647	1,050,459	2,527,013	1,583,572
1898.....	5,399,654	868,982	2,759,714	801,915	9,830,265	6,794,541	1,125,688	2,995,801	1,162,712

Review of the Crude Rubber Market.

NEW YORK. JANUARY 29, 1916.

THE steady advance in crude rubber that commenced in November continued in the beginning of January and recorded prices that had not been equaled since the spectacular advance in August, 1914. First latex had gained 5 points since December 31 and on January 4 was selling at \$1.05 for spot and near by. Futures were quoted at \$1.04 for January-June and 99 cents for July-December.

Small stocks were responsible for the firm tone in Upriver fine, which had continued to advance steadily with plantations, and sales were reported at \$1 on January 4.

It was clearly evident that the market was top heavy and fundamentally lacking in permanent support from the large buyers. Local dealers realized the speculative character of the situation caused by the uncertainty of arrivals due to the many difficulties surrounding transport service. The reported sinking of two steamers, rubber laden, from the Far East and damage by

fire of another, gave added support to the bullish influence that prevailed in the market.

Despite the artificial support that was given to the already weakening market by speculative interests in London, the decline commenced on January 7 and continued steadily downward in a generally quiet market until January 29, when First latex was quoted at 78 cents and Upriver 76 cents.

The report that Great Britain had decreed that henceforth all shipments should be routed by the way of London cannot be verified. It is obvious that the best interests of England are greatly concerned in obtaining as little interruption as possible in her advantageous rubber trade with the United States. The imports received at the port of New York for the first 17 days of January would apparently indicate a greater tonnage for this month than that of December.

The arrivals will be found in detail in the following pages and in round numbers the totals are as follows: Plantation Pará,

3,700 tons; Pará from Pará and Manãos, 700 tons; Pará from Europe, 51 tons; Africans, 300 tons; Centrals, 150 tons; Manicoba and Cauchó, 200 tons. From these incomplete figures an estimate of 10,000 tons will represent the New York imports for January. Incidentally 90 per cent. of the total United States rubber imports are received at New York.

LONDON.

The first week of January witnessed a four shilling market and an insistent demand for spot rubber. Inquiries were sufficient to carry prices to higher levels and were steady on January 7, with First latex spot selling for 4s. 3/4d. Futures were quoted at 4s. 3d. for April-June deliveries.

Delay in issuing permits continues. Applicants who paid up their figures in order to obtain the release of more rubber than they are entitled to receive would prevent delay by making an honest statement of their requirements. This applies to permits for shipments from the Far East as well as London and Liverpool.

That Great Britain has no intention of impeding shipments to neutral countries is evidenced by the recent order concerning government regulation of cargoes. Necessities are to be given preference over luxuries and rubber is classed as a necessity.

Weakness developed in the market about the middle of this month and prices gradually declined with minor fluctuations until January 29, when First latex was quoted at 3s. 1d. to buyers.

PARA AND MANAOS.

The Federal tax on exports from Brazil has been reduced to 12 per cent., taking effect January 1. The state tax on exports from the state of Matto Grosso has been reduced from 15 to 14 per cent., taking effect on the same date.

RUBBER AFLOAT.

The following formidable fleet of rubber carriers are afloat from the Far East: "Merton Hall," "St. Bede," "Inverclyde," "Suruga" and "Kathlamba." "The Saxon Monarch" and the "Kentigern" are due early in February from London. It is estimated that 2,000 tons will arrive on these steamships.

That rubber is being shipped from Singapore by the way of Hong Kong, China, and Kiobe, Japan, to Pacific ports, whence it is forwarded by rail, is a well known fact in the trade.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago and month ago, and January 29, the current date:

PARA.	Feb. 1, '15.	Jan. 1, '16.	Jan. 29, '16
Upriver, fine, new.....	60 @ 61	87 @ 88	76 @
Upriver, fine, old.....	65 @ 66	87 @ 88	76 @
Islands, fine, new.....	53 @	80 @ 81	69 @
Islands, fine, old.....	41 @ 43	72 @ 73	54 @
Upriver, coarse, new.....	41 @ 43	72 @ 73	54 @
Upriver, coarse, old.....	28 @ 29	45 @ 46	35 @
Islands, coarse, new.....	31 @ 33	49 @ 50	37 @
Islands, coarse, old.....	31 @ 33	49 @ 50	37 @
Cauchó, ball, upper.....	45 @ 46	75 @ 76	59 @ 61
Cauchó, ball, lower.....	40 @ 41	73 @	56 @

PLANTATION HEVEA.

	Spot	Prompt ship.	60 @ 61	99 @ 1.00	78 @
Smoked sheet ribbed.....					
First latex crepe.....	Spot	Prompt ship.	56 @ 57	99 @ 1.00	78 @
First sheets and biscuits, un-smoked.....					78 @

CENTRALS.

	Feb. 1, '15.	Jan. 1, '16.	Jan. 29, '16
Cosentino.....	42 @ 43	69 @	55 @ 56
Emeralda, sausage.....	42 @ 43	68 @	54 @ 55
Nicaragua, scrap.....	41 @	68 @	53 @ 54
Mexican plantation, sheet.....		67 @ 68	53 @ 54
Mexican, scrap.....		67 @ 68	53 @ 54
Mexican, slab.....		55 @ 57	45 @ 46
Manicoba.....	37 @ 40	47 @ 50	35 @ 38
Mangabeira, sheet.....	29 @ 30	48 @	41 @ 42
Guayule.....	53 @	58 @	64 @
Balata, sheet.....	42 @	45 @	46 @
Balata, block.....			

AFRICANS.

	Feb. 1, '15.	Jan. 1, '16.	Jan. 29, '16
Lopori, ball, prime.....	58 @		
Lopori, strip, prime.....	58 @		
Upper Congo, ball, red.....			

Rio Nunez Niggers.....	72 @		
Conakry Niggers.....	72 @		
Massa, red.....	71 @		72
Soulan Niggers.....			
Cameroon, ball.....	48 @		
Benguela No. 2.....	50 @ 51		40 @ 41
Acacia, flake.....	48 @ 50		40 @ 41
EAST INDIAN.			
Assam.....			
Botanik.....	71 @ 72		81 @ 84
Gutta Siak.....	12 @ 13		13 @ 13 1/2
Borneo III.....	34 @		35 @ 35 1/2
Gutta Percha.....			1.50 @ 2.00

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, New York City), advises as follows: "Just around the turn of the year there was not much demand for paper for a few days, but since then it has picked up again, with a good market for the best rubber names at 4@4 1/2 per cent, and those not so well known at 4 1/4@5 1/2 per cent, about the same as in December." Mr. Beers supplied the following statistical tables, which are of interest:

NEW YORK PRICES FOR DECEMBER (NEW RUBBER).

	1913.	1914.	1915.
Upriver fine.....	\$0.72 @ 0.76	\$0.70 @ 0.76	\$0.68 @ 0.87
Upriver coarse.....	.44 @ .47	.51 @ .58	.57 @ .72
Islands fine.....	.59 @ .66	.59 @ .70	.65 @ .80
Islands coarse.....	.27 @ .30	.31 @ .38	.32 @ .45
Cameta.....	.35 @ .37	.34 @ .41	.35 @ .48

Plantation Rubber from the Far East.

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to December 13, 1914 and 1915. Compiled by the Ceylon Chamber of Commerce.)

	1914.	1915.
Great Britain.....	19,564.359	22,895.044
United States.....	9,175.991	17,856.681
Belgium.....	2,084.009	.....
Germany.....	.....	.....
Australia.....	619.175	844.977
France.....	320.152	559.202
Japan.....	609.014	262.661
Russia.....	105.212	332.200
Straits Settlements.....	42.746	119.933
Italy.....	1.772	.....
India.....	1.050	1.530
Canada and Newfoundland.....	.....	392.495
Totals.....	34,120.895	43,264.723

(Same period 1913, 24,579,664 pounds; same period, 1912, 13,167,917)

The export figures of rubber given in the above table for 1914 include the imports re-exported. (These amount to 3,581,356 pounds.) To arrive at the total quantity of Ceylon rubber exported for that period deduct these imports from the total exports. The figures for 1915 are for Ceylon rubber only.

SINGAPORE.

Guthrie & Co., Ltd., report (December 9, 1915): For this week's auction 310 tons were catalogued, and unfortunately it was again found impossible to complete the sale in one day.

On Wednesday morning there was a good demand which was maintained until the lunch interval, but in the afternoon proceedings dragged to some extent. Today the market was much quieter and prices generally marked a material decline from yesterday's levels.

Ribbed smoked sheet averaged about \$187 per picul, an advance of \$24 on the week. For one lot \$300 was paid, but this was of course a purely artificial price. Demand for crepe was in strong demand at about \$187 per picul, all lots readily finding buyers. The lower grades also moved off freely at substantially increased figures.

Of the quantity catalogued 262 tons were sold.

The following was the course of values:

	In Singapore Picul.*	Sterling equivalent per pound in London.	Equivalent per pound in cents.
Sheet, fine ribbed smoked.....	\$179 @ 200	3 1/4 @ 3 9	82.35 @ 91.22
Sheet, fair to good ribbed smoked.....	166 @ 179	3 1/4 @ 3 4 1/2	76.77 @ 82.35
Sheet, plain smoked.....	161 @ 184	3 1/4 @ 3 5 1/2	74.50 @ 84.37
Sheet, ribbed unsmoked.....	150 @ 160	2 10/16 @ 3 5 1/2	69.38 @ 74.24
Sheet, plain, unsmoked.....	147 @ 159	2 10/16 @ 3 1/2	69.17 @ 73.99
Crepe, fine pale.....	174 @ 189	3 3/4 @ 3 6 1/2	80.07 @ 86.40
Crepe, good pale.....	170 @ 173	3 3/4 @ 3 3 1/2	78.55 @ 79.56
Crepe, fine brown.....	170 @ 170	3 1/4 @ 3 3 1/2	77.17 @ 78.55
Crepe, good brown.....	140 @ 154	2 8/16 @ 2 11/16	65.02 @ 71.71
Crepe, dark.....	133 @ 147	2 6/16 @ 2 1/2	62.58 @ 69.17
Crepe, bark.....	108 @ 125	2 1 1/16 @ 2 7/16	51.95 @ 63.60
Scrap, pressed.....	95 @ 105	1 1/11 @ 2 1/11	46.62 @ 50.68
Scrap, loose.....	116 @ 117	2 3/4 @ 2 3/4	55.49 @ 56.00
Scrap, loose.....	81 @ 108	1 8 @ 2 1/8	40.54 @ 51.05

*Picul = 133 1/3 pounds.

Quoted in S. S. dollars = 2/4 [56 cents].

CRUDE RUBBER ARRIVALS AT THE PORT OF NEW YORK.

IMPORTS FROM PARA AT NEW YORK.

(For Figures Indicate Weights in Pounds.)

DECEMBER 30.—By the steamer *Denis* from Pará and Manaós:

	Fine.	Medium.	Coarse.	Cauchó.	Total.
Meyer & Brown	216,500	10,000	176,600	46,200	449,300
Arnold & Zeiss	370,600	36,800	165,400	58,000	630,800
Henderson & Korn	241,300	40,500	61,400	23,500	366,700
Paul Hesthuis	266,300	8,500	37,900	41,900	354,200
General Rubber Co.	237,100	31,600	28,300	13,100	310,100
H. A. Ault & Co.	103,300	13,100	69,700	12,800	197,900
Aldens' Successors, Ltd.	58,900	58,900	69,357	10,421	155,473
Robinson & Co.	78,500	11,400	41,100	12,600	143,600
W. R. Grace & Co.	74,700	4,800	6,900	12,800	99,200
Adolph Hirsch & Co.	44,400	3,400	5,100	7,900	60,800
F. B. Ross & Co.	6,600	1,800	7,700	1,500	17,600
J. T. Johnstone & Co.	6,400	700	8,000	1,500	15,100
Cowdrey & Co.	2,900	700	5,400	9,000	9,000
Muller, Schall & Co.	4,900	—	—	3,100	8,000
Hagemeyer & Braun	—	—	2,100	—	2,100
G. Amsinck & Co.	8,900	6,400	31,200	2,500	123,000
Totals	1,768,408	255,824	715,737	236,094	2,943,073

Manaos:

	Fine.	Medium.	Coarse.	Cauchó.	Total.
Meyer & Brown	88,300	12,000	127,300	33,800	261,400
G. Amsinck & Co.	148,400	12,700	22,000	30,000	203,100
Arnold & Zeiss	92,700	17,000	65,100	13,700	188,500
H. A. Ault & Co.	25,800	2,800	111,500	1,300	166,900
Aldens' Successors, Ltd.	21,907	20,271	29,835	1,634	72,927
Nouss, Hesthuis & Co.	55,000	—	—	—	55,000
Henderson & Korn	10,400	3,300	13,600	—	27,300
W. R. Grace & Co.	10,700	1,100	13,300	—	25,000
F. B. Ross & Co.	2,500	—	1,000	—	3,500
Totals	465,097	75,171	383,335	76,634	1,000,637

JANUARY 8.—By the steamer *Atahualpa* from Pará and Manaós:

	Fine.	Medium.	Coarse.	Cauchó.	Total.
Meyer & Brown	15,100	9,100	14,600	2,500	41,300
G. Amsinck & Co.	35,300	1,000	25,100	64,700	112,900
Aldens' Successors, Ltd.	4,240	8,869	5,738	10,758	49,625
Pell & Dumont	21,600	—	14,300	—	45,900
Robinson & Co.	33,600	—	17,700	—	44,200
Henderson & Korn	16,500	3,600	15,400	—	35,500
W. R. Grace & Co.	8,200	700	2,000	—	10,900
Hagemeyer & Braun	—	—	7,500	—	7,500
Totals	186,640	34,360	93,358	82,458	396,825

PARA RUBBER VIA EUROPE.

	Pounds.		Pounds.		Pounds.
DECEMBER 24.—By the <i>Hanseat</i> =Montevideo:		DECEMBER 27.—By the <i>Tievel</i> =Barrios:		Graham, Hinkley & Co.	500
A. D. Straus & Co.	20,000	W. R. Grace & Co.	1,000	General Export & Commission	200
DECEMBER 30.—By the <i>Altamira</i> =Colon:		DECEMBER 27.—By the <i>Pastores</i> =Port Limon:		JANUARY 14.—By the <i>Santa Marta</i> =Cartagena:	
G. Amsinck & Co. (Cauchó)	10,500	Isaac Brandon & Bros.	1,000	Andean Trading Co.	2,500
W. R. Grace & Co. (Cauchó)	10,000	Kinnaird & Co.	700	G. Amsinck & Co.	200
W. R. Grace & Co. (Coarse)	4,000	Commercial Bank Spanish Amer	300	Various	2,700
JANUARY 4.—By the <i>Calameres</i> =Cristobal:		DECEMBER 30.—By the <i>Altamira</i> =Colon:		JANUARY 17.—By the <i>Morro Castle</i> =Mexico:	
G. Amsinck & Co. (Fine)	8,500	G. Amsinck & Co.	7,600	G. Amsinck & Co.	2,000
G. Amsinck & Co. (Coarse)	1,500	Pablo Calvet & Co.	12,100	Various	10,000
W. R. Grace & Co. (Fine)	6,500	A. Capen's Sons	2,000	JANUARY 20.—By the <i>Panama</i> =Colon:	
W. R. Grace & Co. (Coarse)	1,000	J. S. Sembrado & Co.	1,400	Piza, Nepheus & Co.	5,000
JANUARY 10.—By the <i>Tenadores</i> =Cristobal:		Pottberg, Ebeling & Co.	1,000	Andean Trading Co.	3,500
G. Amsinck & Co. (Cauchó)	30,000	A. Angel & Co.	200	Muller, Schall & Co.	1,600
JANUARY 14.—By the <i>Advance</i> =Colon:		DECEMBER 30.—By the <i>Zacapa</i> =Cartagena:		JANUARY 20.—By the <i>Ancon</i> =Colon:	
W. R. Grace & Co. (Cauchó)	20,500	G. Amsinck & Co.	6,000	G. Amsinck & Co.	25,000
W. R. Grace & Co. (Fine)	11,000	Harburg, Ebeling & Co.	500	Pablo Calvet & Co.	8,000
W. R. Grace & Co. (Coarse)	7,000	JANUARY 3.—By the <i>Mexico</i> =Mexico:		Meyer & Co.	4,800
W. R. Grace & Co. (Cauchó)	7,200	H. Marquardt & Co.	3,500	American Trading Co.	3,500
Eastmond & Co. (Fine)	3,200	Graham, Hinkley & Co.	500	I. Wolf & Co.	3,200
JANUARY 17.—By the <i>Lewis K. Thurlow</i> =Montevideo:		G. Amsinck & Co.	500	J. S. Sembrado & Co.	2,000
W. R. Grace & Co. (Fine)	5,000	JANUARY 4.—By the <i>Calameres</i> =Port Limon:		Harburger & Stack.	1,400
		A. Held	2,500	R. G. Barthold & Co.	600
		Isaac Brandon & Bros.	1,200	Silva Bussenus & Co.	500
		G. Amsinck & Co.	1,000		
		Gontard & Co.	1,000		

AFRICANS.

DECEMBER 27.—By the <i>Lapland</i> =Liverpool:	22,500	Henderson & Korn.	80,000	JANUARY 8.—By the <i>Justin</i> =Ceara and Pernambuco:	233,000
DECEMBER 27.—By the <i>Radja</i> =Penang:	80,000	Various.	7,000	JANUARY 8.—By the <i>Justin</i> =Pernambuco:	53,000
JANUARY 3.—By the <i>Baltic</i> =Liverpool:	7,000	Henderson & Korn.	4,500	Lawrence Johnson & Co. (Manicoba)	3,000
JANUARY 3.—By the <i>Don of India</i> =London:	112,000	Aldens' Successors, Ltd.	112,000	DECEMBER 30.—By the <i>Purus</i> =Bahia:	1,500
JANUARY 4.—By the <i>Francisco</i> =Hull:	112,000	J. T. Johnstone & Co.	112,000	Adolph A. Hirsch & Co.	1,500
JANUARY 6.—By the <i>Lord Sefton</i> =Liverpool:	135,000	Arnold & Zeiss.	135,000	DECEMBER 30.—By the <i>Denis</i> =Pernambuco:	13,000
J. T. Johnstone & Co.	45,000	Goodyear Tire & Rubber Co.	13,500	J. H. Rossbach Bros. & Co. (Manicoba)	2,200
JANUARY 10.—By the <i>Adriatic</i> =Liverpool:	25,000	Henderson & Korn.	18,000	(Cauchó)	15,200
Various	7,000	Various	25,000	JANUARY 17.—By the <i>Asiatic Prince</i> =Bahia:	57,000
JANUARY 12.—By the <i>Orduna</i> =Liverpool:	110,000	Arnold & Zeiss.	110,000	J. H. Rossbach Bros. & Co.	12,000
Rubber Trading Co.	11,200	Various	121,200	Adolph Hirsch & Co.	3,000
JANUARY 12.—By the <i>Philadelphia</i> =Liverpool:	4,500	Fred Stern & Co.	4,500	Various	105,000
JANUARY 17.—By the <i>Roma</i> =Lisbon:	112,000	S. R. Sequerra & Co.	112,000		

CENTRALS.

[* This sign, in connection with imports of Central, denotes Guayule rubber.]		DECEMBER 27.—By the <i>Mexico</i> =Mexico:	500	DECEMBER 27.—By the <i>Radja</i> =Batavia:	34,000
Lehmer & Dinsmore	500	J. A. Meritt	700	Edward Maurer Co. Inc.	145,000
	200			J. T. Johnstone & Co.	150,000
				General Rubber Co.	300,000
				Goodyear Tire & Rubber Co.	90,000
				Manhattan Rubber Co.	45,000
				Ing Co.	10,000
				G. Amsinck & Co.	10,000
				Rubber Trading Co.	25,000
				Various	215,000
				Aldens' Successors, Ltd.	27,164
				T. Littlejohn & Co., Inc.	142,950

EXPORTED TO	Belting, Hose and Packings.	Footwear.		Tires.		Insulated Wire and Cable.	Other Mnf. of India Rubber.	Fountain Pens.	Chewing Gum.	Reclaimed Rubber.	Scrap Rubber.
		Boots.	Shoes.	Auto.	Other.						
FRANCE
Portugal and Madeira Islands
Spain
Italy
Germany
Belgium
Sweden
Denmark
Netherlands
Switzerland
Austria
Prussia
Poland
Czechoslovakia
Yugoslavia
Romania
Bulgaria
Serbia
Croatia
Slovenia
Latvia
Lithuania
Estonia
Finland
Sweden
Norway
Denmark
Iceland
Faroe Islands
United Kingdom—
England
Scotland
Wales
Ireland
France
Germany
Italy
Spain
Portugal
Belgium
Netherlands
Sweden
Denmark
Poland
Czechoslovakia
Yugoslavia
Romania
Bulgaria
Serbia
Croatia
Slovenia
Latvia
Lithuania
Estonia
Finland
Sweden
Norway
Denmark
Iceland
Faroe Islands
United Kingdom—
England
Scotland
Wales
Ireland
France
Germany
Italy
Spain
Portugal
Belgium
Netherlands
Sweden
Denmark
Poland
Czechoslovakia
Yugoslavia
Romania
Bulgaria
Serbia
Croatia
Slovenia
Latvia
Lithuania
Estonia
Finland
Sweden
Norway
Denmark
Iceland
Faroe Islands
United Kingdom—
England
Scotland
Wales
Ireland
France
Germany
Italy
Spain
Portugal
Belgium
Netherlands
Sweden
Denmark
Poland
Czechoslovakia
Yugoslavia
Romania
Bulgaria
Serbia
Croatia
Slovenia
Latvia
Lithuania
Estonia
Finland
Sweden
Norway
Denmark
Iceland
Faroe Islands
United Kingdom—
England
Scotland
Wales
Ireland
France
Germany
Italy
Spain
Portugal
Belgium
Netherlands
Sweden
Denmark
Poland
Czechoslovakia
Yugoslavia
Romania
Bulgaria
Serbia
Croatia
Slovenia
Latvia
Lithuania
Estonia
Finland
Sweden
Norway
Denmark
Iceland
Faroe Islands
United Kingdom—
England
Scotland
Wales
Ireland
France			

EXPORTED TO—	Belting, Hose and Packings.	Footwear.		Tires.		Insulated Wire and Cables.	Other Articles of India Rubber.	Fountain Pens.	Chewing Gum.	Reclaimed Rubber.	Scrap Rubber.
		Boots.	Shoes.	Auto.	Other.						
NORTH AMERICA:											
Bermuda.....	\$50				\$188		\$335		\$197		
British Honduras.....					347		199		86		
Canada.....							66				
Central America—											
Costa Rica.....	\$41			691	413	\$14	823	\$145	38		\$8
Guatemala.....	\$25			100	100	2,371	764		253		
Honduras.....	55			377	277						
Nicaragua.....	59						987				
Panama.....	166.10		\$456	7,173	1,796	9,636	4,357	76	3,986	\$7	
Salvador.....	854			1,941	173	1,314					
Mexico.....	8,013		64	14,957	4,7	83	7,732	32	6		50
Newfoundland and Labrador.....	85	\$78	1,708			72	88		808		
West Indies—											
British—											
Barbados.....				196	519				1		
Jamaica.....	137			5,348	1,406	70	1,023	9	4		
Trinidad and Tobago.....	851			6,938	791	335	1,326	295			
Other British.....	90		71	338	263	230	240				
Cuba.....	6,056		583	78,681	17,890	18,019	32,594	310	396		
Danish.....				388	8	53			5		
Dutch.....	82			385	56	194	83		4		
French.....	13			88			79				
Haiti.....	132		24	363	11	283	40		6		6
Santo Domingo.....	168		48	2,301	575	81	1,304				
Totals, North America.....	\$43,318	\$78	\$2,964	\$123,926	\$29,336	\$32,359	\$55,152	\$867	\$6,142	\$7	\$64
SOUTH AMERICA:											
Argentina.....	\$11,570		\$349	\$54,860	\$3,607	\$16,405	\$13,614	\$241	\$10,157	\$697	
Bolivia.....	1,168					2,119	231				
Brazil.....	5,058	\$671	3,050	23,206	105	39,063	17,427	617	207		
Chile.....	20,988		116	4,679	1,748	16,916	6,198				
Colombia.....	1,144	9	67	2,324	555	2,804	1,857	975	305		
Ecuador.....	245		246	805	1,505	159	1,153		197		
Guayana.....											
British.....	97		24	8	2		198				
Dutch.....				146	5						
Peru.....	4,838	377	134	58	55	4,312	1,892				
Uruguay.....	572			3,007	2,537	382	885		150		
Venezuela.....	1,322		31	11,551	1,288	182	2,293				
Totals, South America.....	\$46,952	\$1,057	\$3,783	\$100,720	\$11,454	\$82,842	\$43,856	\$1,833	\$11,053	\$697	
ASIA:											
Aden.....				\$217							
China.....	\$2,624	\$73		1,243		\$412	\$2,071				
East Indies—											
British—											
British India.....	831			10,536	\$1,530	2	2,097		\$24		
Straits Settlements.....	265			810							
Dutch.....	34			966	569		1,007				
Hongkong.....	350			37			566		5		
Japan.....							23			\$308	
Siam.....						230	52				
Totals, Asia.....	\$4,104	\$73		\$13,809	\$2,099	\$1,144	\$3,763		\$29	\$308	
OCEANIA:											
Australia and Tasmania.....	\$788	\$2,525	\$10,366	\$5,275		\$440	\$6,720	\$188	\$243		
New Zealand.....				134		90			533		
Philippine Islands.....	2,614			19,029	\$7,243	129	3,941	144			
Totals, Oceania.....	\$3,402	\$2,575	\$10,366	\$24,404	\$7,243	\$569	\$10,960	\$332	\$775		
AFRICA:											
British Africa—											
West.....				\$12,686	\$678						
South.....	\$26,736		\$815	65,533	30,653	\$361	\$9,460		\$365		
East.....				527							
Portuguese Africa.....	2,022						359		140		
Totals, Africa.....	\$28,758		\$815	\$78,446	\$31,331	\$361	\$9,819		\$505		

In addition to the above, the following were exported during the same period: Balata to Panama, \$4,267; vulcanized rubber to Portugal, \$125; elastic and substitutes to Costa Rica, \$95; aeroplanes to England, \$155,472; other manufactures of india rubber to Iceland, \$106, and to French India, \$4, and to india rubber to the following countries: France, \$1,505; Portugal, \$27,677; Ireland, \$73,804; Canada, \$1,483; Costa Rica, \$788; Nicaragua, \$133; Panama, \$86; Mexico, \$4,995; Chile, \$5,082; Colombia, \$1,099; Peru, \$36,431; British India, \$287,144; Straits Settlements, \$179,003; Dutch East Indies, \$17,430.

YEARLY EXPORTS AND IMPORTS OF CRUDE AND MANUFACTURED RUBBER BY COUNTRIES.

EXPORTS—CRUDE AND SCRAP RUBBER.

	1913.		1914.	
	Pounds.	Value.	Pounds.	Value.
British India—				
Burma.....	678,160	\$539,290	518,336	\$531,170
Malaya.....		492,710		423,780
Ceylon—To United States.....		5,089,167		4,572,219
Costa Rica.....	226,491	19,877,587	306,734	18,563,935
Yanchoa—To United States.....	104,614	43,772	37,016	15,026
Dutch East Indies—To U. S.....		117,455		709,570
Federated Malay States.....		32,168,129		31,270,043
Manchuria—To United States.....		21,988		1,763
Nicaragua.....	488,169	78,763	314,790	134,337
Straits Settlements.....		20,882,000		19,133,760

IMPORTS—CRUDE AND SCRAP RUBBER.

Ceylon.....		\$1,789,854		\$1,805,705
Ireland.....	18,800			10,954
Japan—From United States.....		99,712		
From Netherlands.....	13,002	\$872	13,893	1,671
From all countries.....		1,719,018		1,960,904
Nicaragua.....		31,231		25,811
Costa Rica.....				

EXPORTS—RUBBER MANUFACTURES.

Ireland.....		714,900		\$797,137
To Great Britain, tires.....		1,059,570		\$5,955,884
Germany, tires.....		928,427		921,189
IMPORTS—RUBBER MANUFACTURES.				
Dutch East Indies.....				\$45,475
From United States.....		\$8,000		900
Gibraltar.....				24
Ireland.....		2,005,860		\$2,336,543
Japan.....				544,172
From United States.....		241,152		900
Manchuria.....				110,475

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF RUBBER AND RUBBER MANUFACTURES.

ARTICLES	October, 1915.		Ten Months Ending October, 1915.	
	Quantity.	Value.	Quantity.	Value.
Unmanufactured—				
Balata.....pounds	196,536	\$79,138	1,777,204	\$675,226
Guayule gum.....	36,205	9,031	4,092,291	1,356,537
Gutta jelutong.....	1,621,601	76,407	17,380,693	825,276
Gutta percha.....	113,931	13,144	1,846,057	216,671
Total.....	1,968,273	\$177,720	25,966,245	\$1,073,710

India rubber (crude).....			220,032	\$100,742
From France.....			6,987	843
Germany.....	57,196	222,337	78,211,776	1,371,844
Portugal.....	4,521,713	2,510,075	74,241,516	39,917,835
United Kingdom.....				
Central Am. States	91,878	36,504	1,063,920	474,305
and Brit. Honduras				
Mexico.....	62,541	20,826	1,491,541	562,281
Brazil.....	3,483,957	1,300,599	41,656,700	17,465,601
Other South America	\$10,600	215,199	4,896,607	2,109,865
East India.....	8,772,243	4,758,919	45,481,900	23,949,578
Other countries.....	3,052	3,052	5,040,937	2,817,487
Total.....	17,503,280	\$8,866,207	177,919,916	\$88,770,201
Rubber scrap (free) pounds	1,204,147	\$83,090	10,011,318	\$696,254
Total unmanufactured.....		\$9,127,017		\$92,540,165
Chicle... (dutiable) pounds	849,910	\$288,377	6,950,560	\$2,286,788

Manufactured—				
Gutta percha (dut.) pounds		\$869		\$8,957
India rubber.....		14,668		389,517
Total manufactured.....		\$15,537		\$395,474
Substitutes—elasticon, etc.		\$824		\$13,938

EXPORTS OF DOMESTIC MERCHANDISE.

Scrap and old rubber.....pounds	344,894	\$32,391	2,515,737	\$290,349
Reclaimed rubber.....	367,191	48,857	5,123,552	689,352
Belted, hose and packing.....		229,986		1,636,372
Rubber boots.....pairs	193,226	431,468	342,577	775,601
Rubber shoes.....	218,251	125,637	1,728,666	1,286,990
Fountain pens.....number	5,008	3,658	179,909	188,516
Automobile tires—				
To England.....		\$936,571		\$5,037,891
Canada.....		158,637		976,100
Mexico.....		29,907		108,811
Cuba.....		51,234		270,843
Australia.....		51,479		415,523
Other countries.....		46,919		243,405
Total.....		\$72,245		1,395,988
Total.....		\$1,346,942		\$8,448,563
All other tires.....		\$378,412		\$1,524,504
All other rubber manufactures		\$35,032		4,090,607
Total manufactures of india rubber.....		\$3,322,393		\$18,931,254

EXPORTS OF FOREIGN MERCHANDISE.

Unmanufactured—				
Balata.....pounds	13,768	\$4,922	784,360	\$307,479
Guayule gum.....			47,301	16,701
Gutta jelutong.....			162	18
Gutta percha.....			49,178	10,297
India rubber.....	446,562	237,252	4,038,881	2,035,445
Rubber scrap or refuse.....	2,462	296	5,945	669
Total unmanufactured.....	465,792	\$242,470	4,925,917	\$2,370,609
Chicle.....pounds	4,796	\$1,451	453,530	\$150,653
Manufactured.....				
Gutta percha.....pounds		\$166		\$185
India rubber.....		1,422		8,314
Total manufactured.....		\$1,588		\$8,499
Substitutes—elasticon, etc.....				\$364

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

Alaska:				
Belted, hose and packing.....		\$6,121		\$107,302
Boots and shoes.....pairs	7,412	17,197	56,375	164,523
All other rubber mfr.....		4,089		23,368
Total.....		\$27,407		\$295,252
Hawaii:				
Belted, hose and packing.....		\$5,330		\$59,590
Automobile tires.....		45,139		361,327
All other tires.....		5,770		45,634
All other rubber mfr.....		6,405		52,340
Total.....		\$62,635		\$518,891
Porto Rico:				
Belted, hose and packing.....		\$3,944		\$27,048
Automobile tires.....		34,328		256,961
All other tires.....		754		25,046
All other rubber mfr.....		7,440		55,890
Total.....		\$46,468		\$364,945

Philippine Islands:				
Belted, hose and packing.....		\$3,388		\$44,004
Boots and shoes.....pairs	6,980	6,031	35,624	32,307
Tires.....		57,327		335,908
All other rubber mfr.....		20,744		117,555
Total.....		\$87,490		\$519,264

RUBBER STATISTICS FOR CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED, FREE—	October, 1915.		Seven Months Ending October, 1915.	
	Pounds.	Value.	Pounds.	Value.
Rubber and gutta percha, crude (excludes oil-soluble rubber):				
From Great Britain.....	403,208	\$235,269	2,876,838	\$1,518,831
United States.....	336,232	168,592	2,324,332	1,161,874
Brit. Straits Settlements.....			22,574	11,659
Other countries.....			169,898	79,492
Total.....	739,440	\$403,861	5,393,642	\$2,771,856
Rubber, recovered:				
From Great Britain.....			4,392	\$2,482
United States.....	322,505	\$41,331	27,700,807	\$34,926
Total.....	322,505	\$41,331	27,705,199	\$345,408
Hard rubber, in sheets and rods:				
From Great Britain.....	4	\$5	4	\$5
United States.....	13,601	1,232	50,050	5,671
Total.....	13,605	\$1,237	50,054	\$5,676
Rubber substitutes:				
From Great Britain.....			10,820	\$1,166
United States.....	38,692	\$2,552	269,825	19,708
Total.....	38,692	\$2,552	280,645	\$20,874
Rubber, powdered, and rubber or gutta percha waste:				
From Great Britain.....			2,709	\$217
United States.....	144,135	\$5,295	713,504	46,725
Other countries.....	270	14	2,979	127
Total.....	144,425	\$5,309	719,192	\$47,069
Rubber thread, not covered:				
From United States.....	3,850	\$5,327	16,830	\$23,245
Balata, crude:				
From United States.....			1,644	\$991
Chicle, crude:				
From Great Britain.....			2,888	\$1,675
United States.....	3,868	\$3,080	179,559	70,532
British Honduras.....	170,044	64,697	787,008	289,622
Mexico.....	\$8,729	25,469	185,093	67,337
Total.....	234,711	\$91,186	1,154,548	\$431,566

MANUFACTURED, DUTABLE—	October, 1915.		Seven Months Ending October, 1915.	
	General Tariff	Preferential Tariff	General Tariff	Preferential Tariff
Waterproof clothing:				
From Great Britain.....	\$572	\$15,915	\$3,407	\$247,744
United States.....	4,941		70,581	
Other countries.....			21	
Total.....	\$5,513	\$15,915	\$74,009	\$247,744
Hose, lined with rubber:				
From Great Britain.....				\$389
United States.....	\$6,577		\$43,972	
Total.....	\$6,577		\$43,972	\$389
Mats and mattings:				
From Great Britain.....				\$84
United States.....	\$110		\$894	
Total.....	\$110		\$894	\$84
Packing:				
From Great Britain.....			\$110	\$972
United States.....	\$3,474		30,131	
Total.....	\$3,474		\$30,241	\$972
Tires of rubber for all vehicles:				
From Great Britain.....		\$908	\$9,271	\$17,427
United States.....	\$142,339		810,897	
France.....	1,792		13,377	
Other countries.....			1,130	
Total.....	\$144,021	\$998	\$837,375	\$17,427
*Rubber cement and all manufactures of india rubber and gutta percha, N. O. P.:				
From Great Britain.....	\$73	\$8,915	\$1,685	\$102,502
United States.....	47,667		326,085	
Other countries.....	380		614	
Total.....	\$48,020	\$8,915	\$328,381	\$102,502

*In addition, the imports of rubber cement and all manufactures of india rubber and gutta percha amounted to \$28 from various countries during October; and \$196 from Great Britain, and \$1,305 from other countries for the seven months ending October, 1915, the values being at treaty rates.

	Seven Months Ending October, 1915.				1914.				Total Sales from Jan. 1 to Oct. 31, 1915.	
	General Tariff Value.	Preferential Tariff Value.	General Tariff Value.	Preferential Tariff Value.	Manila.	Sumatra.	Amboina.	Panama.	Pounds.	Value.
MANUFACTURED, DUTABLE—										
Hard rubber, unfinished, in tubes, for manufacture of fountain pens:					India rubber and gutta percha threads:					
From United States	\$58.3		\$25.54		From Great Britain	19,800			34,320	
From Great Britain	832	\$370	842	\$6,452	United States	3,110			.....
United States	11,662		78,451		Other countries	4,050			2,420	
Other countries .....	.....		880		Total	66,000	\$115,800		78,980	\$124,716
Total	\$11,664	\$370	\$79,883	\$6,452	India rubber and gutta percha sheets:					
Webbing, over one inch wide:					Cut sheets	26,400	\$45,772		14,740	\$22,834
From United States .....	.....		.....		Elastic fabrics:					
From Great Britain .....	.....		.....		From Austria-Hungary	176,000			13,186	
United States	\$11,778		\$49,056		Latex	71,830			45,199	
Other countries .....	.....		10		Germany	457,380			42,460	
Total	\$11,778		\$49,069	\$11,546	Great Britain	117,920			14,740	
Belting:					Other countries	118,580			85,990	
From United States .....	.....		.....		Total	931,700	\$767,050		258,280	\$213,361
From Great Britain	\$7,018		\$32,964	\$1,041	For insulated wire	2,970	\$573		220	\$104
United States .....	.....		.....		Hard rubber	56,700	10,943		23,100	14,186
Other countries .....	.....		.....		India rubber in tubes:					
Total	\$7,018		\$33,966	\$1,041	Cut sheets	7,480	\$13,125		1,540	\$2,297
EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.										
	Seven Months Ending October, 1915.				1914.				Total Sales from Jan. 1 to Oct. 31, 1915.	
	Prod. of Canada.	Re-exports of foreign goods.	Prod. of Canada.	Re-exports of foreign goods.	Manila.	Sumatra.	Amboina.	Panama.	Pounds.	Value.
MANUFACTURED, DUTABLE										
Belting:					Rubber fabric:					
To United States .....	.....		\$337	\$58	From Austria-Hungary	26,400			880	
Newfoundland .....	.....		74		Germany	202,620			5,720	
Other countries	\$53		33		Other countries	36,580			34,100	
Total	\$53		\$444	\$58	Total	265,520	\$97,839		40,700	\$17,495
Hose:					Other forms	56,980	\$22,494		3,520	\$1,698
To Great Britain	\$974		\$5,113		Rubber belting	67,320	\$35,435		59,400	\$31,266
United States .....	.....	\$56	3,123	\$201	Rubber coated fabric—pieces:					
Newfoundland	603		2,895		From Austria-Hungary	51,480			.....
Other countries	105		1,760		Great Britain	51,700			26,480	
Total	\$1,682	\$56	\$12,890	\$201	Other countries	44,600			2,640	
Boots and Shoes:					Total	147,840	\$76,772		32,140	\$21,134
To Great Britain	\$40,418		\$66,904		Rubber boots and shoes—pairs:					
United States	7	\$5	3,517	\$492	From Austria-Hungary	3,084			1,581	
Newfoundland	14,719		45,679		France	376			126	
Australia	1,637		11,693		Germany	5,792			4,224	
Other countries	3,003		12,634		United States	28,488			28,812	
Total	\$59,784	\$332	\$140,427	\$819	Other countries	3,459			159	
Mats and matting:					Total	36,199	\$27,947		34,852	\$26,906
To various countries .....	.....		\$418	\$418	Waterproof apparel	3,300	\$6,370		2,640	\$4,864
Clothing:					Tires:					
To Great Britain .....	.....		\$27	\$10	From France	950,180			306,960	
United States .....	.....		39	\$62	Germany	1,296,680			2,640	
Newfoundland .....	.....		140		Great Britain	288,980			196,840	
Other countries .....	.....		24		Russia	177,000			.....
Total .....	.....		\$230	\$212	Other countries	65,120			53,600	
*Rubber waste:					Total	2,788,940	\$3,669,993		565,840	\$689,990
To United States	\$34,318	\$170	\$320,250	\$1,964	Other rubber manufactures:					
All other, N. O. P.: .....	.....		.....		From Austria-Hungary	108,240			13,640	
To Great Britain	\$98,973		\$444,764	\$1,954	France	36,400			1,388,940	
United States	6,548	\$2,117	74,645	268,389	Germany	325,520			6,340	
Newfoundland	158		4,037	785	Great Britain	193,380			876,480	
Australia .....	.....		2,964		Other countries	38,060			266,760	
Other countries	32,138		61,988	10	Total	687,600	\$361,876		3,078,900	\$1,350,518
Total	\$137,817	\$2,117	\$588,398	\$271,138	Total Imports .....	.....	\$10,724,962		.....	\$8,098,376
†Gum chicle:					EXPORTS.					
To Great Britain .....	.....		\$5,000		India rubber and gutta percha					
United States	\$96,013	\$2,423	433,495	\$9,415	—raw and reclaimed	593,980	\$153,323		590,040	\$102,466
Other countries	3,140		42,216	1,107	Rubber scrap	337,920	\$20,751		15,180	\$932
Total	\$100,055	\$2,423	\$476,715	\$95,525	MANUFACTURED—					

*For the month of October the total weight of rubber waste exported to the United States was 564,000 pounds, and for the seven months ending October, was 5,283,700 pounds.

†For the month of October the total weight of gum chicle exported to the United States was 177,035 pounds, and to other countries 4,632 pounds. For the seven months ending October 10,000 pounds was exported to Great Britain, 974,210 pounds to the United States, and 66,834 pounds to other countries.

RUBBER STATISTICS FOR ITALY.

IMPORTS.

	1914.		Ten Months from Jan. 1 to Oct. 31, 1915.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—				
India rubber and gutta percha—raw and reclaimed:				
From Straits Settlements	853,160		2,262,040	
African Fr. Colony	68,240		48,840	
Pelevon Congo	179,240		240,900	
Brazil	5,033,160		4,001,580	
Other countries	588,500		726,000	
Total	6,718,800	\$5,304,799	9,479,360	\$5,821,189
Rubber scrap	1,870,440	\$147,680	2,453,000	\$157,392

India rubber in sheets:				
Cut sheets	120,120	\$9,9482	18,360	\$47,660
Rubber fabric	352,440	400,841	398,200	491,490
For insulated wire .....	.....	.....	1,190	241
Hard rubber	880	540	20,460	12,584
India rubber in tubes:				
Cut sheets	880	\$1,544	5,720	\$8,531
Rubber fabric	34,980	12,889	73,480	31,586
Other forms	55,880	2,260	58,960	
Rubber belting	11,060	8,132	5,720	\$3,011
Rubber coated fabric—pieces:	20,240	\$13,317	11,940	\$50,489
Rubber boots and shoes—pairs:	.....	.....	50	\$39
Waterproof apparel	5720	\$11,640	440	\$811

UNMANUFACTURED	1914.		Ten Months from Jan. 1 to Oct. 31, 1915.	
	Pounds.	Value.	Bonals.	Value.
To Austria-Hungary	1,195,700			
Belgium	34,280			
France	113,080		154,440	
Germany	700,040			
Great Britain	4,526,060		2,165,020	
Switzerland	396,800		115,600	
Australia	43,460		43,460	
Argentina	434,720		881,760	
Brazil	87,560		312,400	
Other countries	60,740		3,090,280	
Total	8,222,280	\$10,419,773	6,866,860	\$8,373,512
Other manufactures not specified				
India	2,159	\$375,055	2,125	\$291,189
Total Exports		\$9,494,855		\$11,138,916

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

DURING January the market has maintained the same features which characterized the business for December. The demand in all lines has been steady and prices have remained very firm. The advances in prices in all lines being retained without exception. There is an excess of demand over production in such lines as lithopone, zinc oxide, aniline oil and benzol. Lithopone and zinc oxide supplies, both domestic and foreign, are practically fully contracted for several months to come.

The following are the spot prices current on the London market, January 8: Benzol, 90%, 25@26 cents; red lead, English, per ton, \$171; white lead, English, \$179 per ton; flowers of sulphur, \$58 per ton.

PRICES OF CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK, JANUARY 29, 1916.

Subject to change without notice.

Acetone (drums)	.lb.	\$0.35	@	\$0.40
Acid, acetic, 28 per cent. (bbls.)	.lb.	.06	@	.07
Glacial, 99% (carboys)	.lb.	.20	@	.25
Aluminum Flake (carloads)	.ton	18.00	@	20.00
Ammonium carbonate		None		
Antimony, crimson, sulphuret of (casks)	.lb.	.80	@	.85
golden, sulphuret of (casks)	.lb.	.65	@	.70
Asbestos	.ton	19.00	@	20.00
Asbestos	.lb.	.04	@	.05
Asphaltum "G" Brilliant	.lb.	.33	@	.35
Barium sulphate, precipitated	.ton	31.00	@	33.50
Barytes, pure white	.ton	30.00	@	31.00
oil color	.ton	20.00	@	21.00
Basofo	.ton	105.00	@	120.00
Benzol, pure	.gal.	.80	@	.90
Beta-Naphthol	.lb.	1.50	@	3.00
Black Hypo	.lb.	.39	@	.40
Bone ash	.lb.	.10	@	.10
black	.lb.	.02 1/2	@	.05
Cadmium tri-sulphate		None		
yellow		None		
Cantella gum	.lb.	.27 1/2	@	.35
Carbon, bisulphide (drums)	.lb.	.07 1/2	@	.08
black (cases)	.lb.	.15	@	.15
tetrachloride (drums)	.lb.	.18	@	.20
Caustic soda, 50 per cent. (bbls.)	.cwt.	5.75	@	6.00
precipitated, heavy	.lb.	.05	@	.05
China clay, domestic	.ton	13.50	@	15.00
imported	.ton	32.00	@	35.00
Chrome, green	.lb.	.16	@	.12
yellow	.lb.	.23	@	.28
Coal tar	.ton	.09	@	.09
Cotton linters	.lb.	.07	@	.12
Emarac	.ton	.07 1/2	@	.08
Gas black	.lb.	.07 1/2	@	.08
Gilacote	.ton	37.50	@	42.50
Glycerine, C. P. (drums)	.lb.	.53 1/2	@	.56
Graphite, black (250 to 400 pound bbl.)	.lb.	.06	@	.14
powdered (250 to 400 pound bbl.)	.lb.	.06	@	.10
Green oxide of chromium (casks)	.lb.	.42	@	.50
Ground glass	.lb.	.02 1/2	@	.03
Indian red	.lb.	.03 1/2	@	.07
Infusorial earth, powdered	.ton	50.00	@	50.00
labeled	.ton	60.00	@	60.00
Iron oxide, red, reduced grades	.lb.	.02 1/2	@	.06
red, pure	.lb.	.05 1/2	@	.09

Ivory, black	.lb.	.08	@	.12
Lampblack	.lb.	.05 1/2	@	.15
Lead, red oxide of	.lb.	.07 1/2	@	.08
sublimed blue	.lb.	.06 1/2	@	.07
white, heavy	.lb.	.07	@	.07 1/2
white, basic sulphate	.lb.	.06 1/2	@	.07
Lime, flour	.lb.	.07	@	.07 1/2
Litharge	.lb.	.07	@	.07 1/2
English	.lb.	None		
Lithopone, domestic	.lb.	.10 1/2	@	.13
Imported	.lb.	.10 1/2	@	.13
Magnesia, carbonate	.lb.	.14	@	.15
calcined, heavy	.lb.	.35	@	.40
acid	.lb.	.35	@	.40
Magnesite, calcined, powdered	.ton	30.00	@	35.00
Mica, powdered	.lb.	.03 1/2	@	.05
Mineral rubber	.lb.	.01 1/2	@	.04 1/2
Naphtha, stove gasoline (steel bbls.)	.gal.	.21	@	.22
66@68 degrees	.gal.	.25	@	.26
68@70 degrees	.gal.	.26	@	.27
V M & P	.gal.	.21	@	.21
Oil, aniline	.lb.	1.20	@	1.40
linseed (bbls.)	.gal.	.74	@	.79
palm	.gal.	.09 1/2	@	.10 1/2
pine (cases)	.ton	.55	@	.60
rapeseed	.ton	1.03	@	1.12
fused	.lb.	.32	@	.36
rosin, heavy body	.lb.	.32	@	.36
tar (cases)	.lb.	.30	@	.31
soluble aniline colors, yellow, orange, red, blue, green	.lb.	3.00	@	3.50
Orange mineral, domestic	.lb.	.10	@	.10 1/2
Paragol	.lb.	.07 1/2	@	.07 1/2
Petroleum grease	.lb.	.04	@	.04
Pine tar, retort	.gal.	.14	@	.16
Pitch, burgundy	.lb.	.04 1/2	@	.05 1/2
Plaster of paris	.lb.	1.50	@	1.70
Prussian blue	.lb.	1.50	@	1.75
Pumice stone, powdered (bbls.)	.lb.	.02	@	.03
Resin, Pontianak, refined	.lb.	.12	@	.15
granulated	.lb.	.12	@	.15
12 @ 20	.lb.	.12	@	.15
Rosin (500 pound bbls.)	.lb.	5.50	@	6.65
Rotten stone, powders	.lb.	.02 1/2	@	.04
Rubber black	.lb.	.03	@	.03
Rubber substitute, black	.lb.	.07 1/2	@	.08
white	.lb.	.10	@	.13
Shellac, fine orange	.lb.	.25	@	.28
Soapstone, powdered	.ton	10.00	@	12.00
Starch, corn, powdered	.lb.	.02	@	.02 1/2
Sulphur chloride (drums)	.lb.	.08 1/2	@	.09
Sulphur, flowers	.cwt.	2.20	@	2.60
Sulphuric acid, 66	.lb.	.02	@	.02 1/2
Talc, American	.ton	8.50	@	13.00
French	.ton	25.00	@	30.00
Toluol, pure	.gal.	4.75	@	5.00
Tripolite earth, powdered	.ton	50.00	@	60.00
Turpentine, pure gum spirits	.gal.	.58	@	.58
wood	.gal.	.54	@	.54
Ultramarine, blue	.lb.	.05	@	.22
Vermilion, brilliant	.lb.	.90	@	1.00
Chinese	.lb.	2.25	@	2.50
English	.lb.	3.00	@	3.00
Wax, tallow	.lb.	.22	@	.24
beeswax, white	.lb.	.47	@	.55
ceresin, white	.lb.	.14	@	.16
carnauba	.lb.	.22	@	.47
ozokerite, black	.lb.	.40	@	.40
green	.lb.	.60	@	.75
montan	.lb.	.25	@	.30
paraffin, refined,				
118/120 m. p. (cases)	.lb.	.04 1/2	@	.04 1/2
123/125 m. p. (cases)	.lb.	.04 1/2	@	.04 1/2
128/130 m. p. (cases)	.lb.	.05 1/2	@	.05 1/2
133/136 m. p. (cases)	.lb.	.06 1/2	@	.06 1/2
crude, white, 117/119 m. p. (bbls.)	.lb.	.03 1/2	@	.03 1/2
yellow, 124/126 m. p. (bbls.)	.lb.	.03 1/2	@	.03 1/2
Whiting, Alba, factory	.f. o. b. factory ton	7.00	@	8.50
commercial	" " cwt.	.55	@	.65
gilders	" " cwt.	.65	@	.75
Paris white, American	" " cwt.	.85	@	.95
English chistone	" " cwt.	.90	@	1.25
Wood pulp XXX	.ton	30.00	@	30.00
Yellow ochre	.lb.	.02	@	.02 1/2
Zinc oxide, American process, horsehead brand				
"Special"	.f. o. b. factory lb.	.09 1/2	@	.09 1/2
"XX red"	" " lb.	.08 1/2	@	.08 1/2
French process, green seal	" " lb.	.16 1/2	@	.16 1/2
red seal	" " lb.	.16	@	.16
white seal	" " lb.	.17	@	.17 1/2
Zinc oxide, imported, white seal	.lb.	.28	@	.28
Zinc sulphide, pure	.lb.	.07 1/2	@	.14

MARKET FOR COTTON AND OTHER FABRICS.

EGYPTIAN COTTON.

LATE in the month the cables announced the indefinite closing of the cotton exchange at Alexandria, Egypt, due to the highly speculative character of the market that had become demoralized by the difficulties encountered in shipping.

COTTON DUCK.

The mechanical duck situation has not materially changed during January and the market activity, particularly in the heavy grades that prevailed during the past month, continues at present. The mills are all running at full capacity and the question of delivery rather than price is the principal factor in writing contracts.

Hose and belting duck have advanced; the former selling at 26-27 cents and the latter at 25-26 cents. The mechanical goods trade has been improving steadily and several large buyers have been written up for delivery, covering the greater part of 1916.

DRILLS AND OSNABURGS.

The demand continues to be heavy and severely taxes the efforts at the mills to meet the situation with increased production. The calls for wide drills, particularly the 52 and 60-inch, are insistent and deliveries are now being written for July. Prices have undergone an upward change of one-quarter to one-half cent the yard, in the entire list and are firm at the quoted figures.

There are no stocks of osnaburgs in sight and prices have advanced a half cent and one cent the yard on certain grades. Deliveries can not be made before May.

TIRE FABRICS.

The shutting off of the supply of Egyptian cotton has strengthened the position of Sea Island fabrics and still higher prices are frankly predicted. Sea Island building fabric has advanced 6 cents and Egyptian combed shows a gain of 5 cents during the past month. Inquiries from recently formed firms indicate that the number of new tire plants is steadily increasing, giving added support to the fabric manufacturers' estimate of 15,000,000 tires as the production for 1916.

YARN DYED GOODS.

The general condition has undergone little change during the past month with the exception of prices which are still advancing. All former quotations have been withdrawn and new business is done at prices ruling on the day the orders were taken. Until the present time it has never been necessary on the part of the mills to accept orders conditional on the supply of materials. But now all orders are taken subject to the condition that the mills will be able to procure the necessary dye stuffs to complete the contract.

The following are New York quotations on January 29, 1916:

Aeroplane and Balloon Fabrics:

Wamsutter, S. V. L. Co. N. 1, 40-ounce yard \$1.32 @
N. 2, 38-ounce " .25 @
O. N. B. Station " .11 @

Wool Stockinettes—52 inch:

A—14-ounce yard 1.12½ @
B—14-ounce " 1.25 @
C—14-ounce " 1.50 @

Cotton Stockinettes—52 inch:

D—14-ounce yard .40 @ .50
E—11½-ounce " .39 @ .40
F—14-ounce " .53 @ .54
G—8-ounce " .43 @ .44
H—11-ounce " .48 @ .49
I—9-ounce " .40½ @ .41½

Colors—white, black, blue, brown.

Tire Fabrics:
17½-ounce Sea Island, combed square yard 75 @ 78

17-ounce Sea Island, combed " 63 @ .65
17-ounce Sea Island, combed " 55 @ .58
17-ounce Sea Island, combed " 43 @ .45

Sheeting:

40-inch 2.35-yard yard .10¼ @ .10¼
40-inch 2.70-yard " .09 @ .09½
40-inch 3.00-yard " .08 @ .08½
40-inch 2.85-yard " .07¼ @ .08¼
40-inch 3.15-yard " .08 @ .08½

Osnaburgs:

30-inch 2.50-yard yard .11½ @
40-inch 2.80-yard " .10½ @
42-inch 3.10-yard " .10½ @

Mechanical Ducks:

Hose pound .26 @ .27
Belting " .25 @ .26

Carriage Cloth Duck:

38-inch 2.00-yard enameling duck yard .13 @ .14
38-inch 1.74-yard " .14½ @ .15
72-inch 16.00-ounce " .28 @ .29
72-inch 17.21-ounce " .29 @ .30

Drills:

38-inch 2.00-yard yard .14 @ .15
38-inch 2.47-yard " .10 @ .10½
52-inch 1.90-yard " .13¼ @ .15
52-inch 1.95-yard " .12½ @ .15
60-inch 1.52-yard " .16¼ @ .19¼

Yarns:

Garden Hose 12½ cabled pound .21 @ .21½
Fire Hose 12/1 " .24 @ .24½

Imported Woaden Fabrics Specially Prepared for Rubberizing.

Plain and Fancies:

63-inch, 3¼ to 7½ ounces per square yard yard .38 @ .55
36-inch, 2¼ to 5 ounces per square yard " .35 @ .85

Plaid Lining:

63-inch, 2 to 4 ounces per square yard yard .35 @ .75
36-inch, 2 to 4 ounces per square yard " .20 @ .45

Domestic Worsted Fabrics:

36-inch, 4½ to 8 ounces per square yard yard .28 @ .35

Raincoat Cloth:

Bombazine yard .06 @ .07½
Twills " .10 @ .12½
Tweed " .10 @ .30
Tweed, printed " .06 @ .11
Plaid " .06 @ .08
Rep " .18½ @ .22

Parlups:

12-7½-ounce 100 yards 6.60 @
40-7½-ounce " 7.15 @
40-8-ounce " 7.35 @
40-10-ounce " 11.25 @
40-10½-ounce " 11.50 @
45-7½-ounce " 8.35 @
45-8-ounce " 8.50 @
48-10-ounce " 12.50 @

CANADIAN IMPORTS OF COTTON FABRIC.

ARTICLES, DUTYABLE	October, 1915.		Seven Months Ending October, 1915.	
	General Tariff Value.	Preferential Tariff Value.	General Tariff Value.	Preferential Tariff Value.
Stockinettes for the manufacture of boots and shoes:				
From Great Britain		\$295		\$1,217
United States	\$11,241		\$44,318	
Total	\$11,241	\$295	\$44,318	\$1,217
Cotton duck, gray or white, N. O. P.				
From Great Britain	\$1,528	\$5,438	\$2,828	\$31,113
United States	48,821		198,093	
Other countries	83		94	
Total	\$50,432	\$5,438	\$201,127	\$31,113
ARTICLES, FREE.—Cotton or linen seamless duck, in circular form for use in hose pipe, was imported from United States only, and amounted to \$2,837 for October, making a total of \$25,598 for the seven months ending October, 1915.				



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BENZOL PRODUCTION.

Before the European war the demand in the United States for benzol and toluol products was so small and the price so low that but one company sought to recover them on a large scale. Late in 1914 the price of benzol, and particularly toluol, rose to such a point that many other companies began to build plants to recover these oils, and by the end of 1915 there were 19 new plants for rubber recovery in operation and others in course of erection.

Reports indicate that the output of benzol and other light oils in 1915 amounted to 13,942,763 gallons. In the 6,620,093 gallons of oils refined at the place of recovery, there were 4,833,939 gallons of 100 per cent benzol, 1,315,727 gallons of toluol, and 470,425 gallons of solvent naphtha.

The annual capacity of the benzol recovery plants now in operation is estimated at over 20,000,000 gallons, and with the completion of plants now building will probably exceed 22,000,000 gallons. The value of these products is indicated by the price currently reported during the year. Benzol, normally selling for 20 cents or less a gallon, in September brought as high as \$1.25 for immediate shipment and 65 cents on contract; toluol, with a normal price of 25 cents, was sold for as much as \$6 a gallon for immediate delivery and was contracted for at \$4.25 per gallon.

with scarcity of materials and
 ces, is the chemist more neces-
 ever to the rubber manufacturer.
 p you.

RICK J. MAYWALD, F. C. S.
 CONSULTING CHEMIST
 'Phone, 823 John New York

BUYERS' DIRECTORY
 PAGE 73

HARRY M. HOPE
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MARCH 1, 1916.

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TABLE OF CONTENTS ON LAST PAGE OF READING.**PREPAREDNESS AND THE RUBBER TRADE.**

THE rubber manufacturers of the United States, through the action and intelligent work of the Preparedness Committee of the Rubber Club, are rapidly getting into line for a most vigorous and practical campaign. They have not been side-tracked by such questions as how many atomizers could be mobilized for hospital use in the event of war. They are driving straight at the mark, which is men, munitions, in fact, the real factors of national defense.

The first committee of four, Messrs. Price, Work, Mitchell and Colonel Townsend, has been expanded until it takes in all of the firm members of the Rubber Club.

President Firestone, ex-President Hodgman and Secretary Vorhis with the Preparedness Committee, are hard at work organizing a campaign that shall be so comprehensive, forceful and sane that it will appeal to every true American.

To quote from one of the big rubber companies: "The safety of America depends upon the part which the business world plays in the immediate future in achieving industrial mobilization, and assisting the government towards a more business-like administration."

THE AMERICAN RUBBER EXPORTS IN 1915.

THE year 1915 broke all records for American exports, the value of which amounted to \$3,550,915,393, against \$2,113,624,050 for 1914, and \$2,484,018,292 for 1913. It is, however, hardly fair to judge the volume of the 1915 exports by their money value, as many of the products were sold at "war prices," materially in advance of those obtainable in normal times.

Exports of rubber goods in 1915 were made on an extensive scale according to official reports that have just come to hand. They amounted to \$24,415,906, more than double those of 1914, and nearly double those of each of the three previous years. An examination of the statistics, published elsewhere in this issue, exhibits some interesting comparisons.

The increased exports of automobile tires in 1915 is really stupendous. During last year \$11,415,481 worth was shipped, against \$3,315,116 in 1914 and \$3,910,688 in 1913. A comparison of the destination of these tires is interesting. England bought \$6,689,584 worth against \$1,458,777 the year previous; Canada received one-third more than in 1914 and Mexico and the Philippines twice as much. Tires valued at \$920,542 were exported to Cuba and Australia in 1915. The statistics for 1914 show no exports of tires to these countries. In 1914 Germany and Belgium received \$82,218 worth of tires, but none are shown for 1915. To other countries not enumerated the report shows exports of \$2,165,112 in 1915 against \$674,306 in 1914.

The above represent only automobile tires. Exports of all other tires, truck, motorcycle, bicycle, etc., in 1915, amounted to \$1,995,319 or over four times that of the previous year.

Spectacular increase was also exhibited in rubber boots which were exported in 1915 to the value of \$1,228,681, practically twice the 1914 value of \$616,602, and more than four times that of 1913, when \$282,598 represented the exports.

The value of rubber shoes slightly exceeded that of previous years, the exports being \$1,475,697 in 1915, \$1,402,503 in 1914 and \$1,008,167 in 1913.

Belting, hose and packing were sent out in slightly reduced amounts. The comparative figures are: \$2,012,556 in 1915, \$2,098,506 in 1914 and \$2,486,843 in 1913.

Under the classification of all "other rubber manufactures" in which druggists' sundries and insulated wire and cables play an important part, the exports in 1915 amounted to \$5,100,959 against \$3,016,098 in 1914 and \$3,767,554 in 1913.

Scrap rubber exports show material losses. The exports for the year were \$356,350, which is about \$52,000 less than in 1914, and less than half as much as in 1913. Reclaimed rubber also exhibits a slight decrease, although during 1915 it was exported to the value of \$830,836.

The statistics represent a condition that is exceedingly gratifying. Whether the high record of the present year will equal or exceed that of 1915, is yet to be determined. The countries to which the greatest amount of rubber goods was sent in 1915 are placing their factories in condition to supply more and more of their war requirements. Money in Europe is being spent less freely than a few months ago, and unless American rubber manufacturers make a strong effort to increase their export trade in markets other than European, it would not be surprising to see the 1916 figures smaller than those for 1915.

THE RUBBER CLUB'S NEW PRESIDENT.

THE rubber trade is to be congratulated upon the election of Harvey S. Firestone to the presidency of The Rubber Club of America, Inc. Heretofore, the chief executives of the association have been eastern men drawn from the rubber centers close to Boston or New York. Mr. Firestone comes from Akron, the greatest rubber city in the world. Accustomed to big things accomplished with the speed of magic, he is not likely to be too much hampered by precedent or controlled by convention.

He is also a self-made man who has known the day of small beginnings. He has fought his way upward, not by pulling others down, but by helping them up with him. Today, as the head of one of the great rubber companies, he is the same capable, friendly, unassuming gentleman that he was at the beginning.

A wonderful organizer, he has surrounded himself with young enthusiastic "live wires," and this same faculty is sure to be of value to the Rubber Club.

Finally, he is fortunate in having a breadth of view

that is unusual. His pioneers long ago explored and reported upon the sources of wild and planted rubber in tropical America and the Far East, and have kept in touch ever since. When, therefore, the question of rubber preparedness really comes to the front, the head of the world's greatest rubber organization will be amply fitted to handle it.

Welcoming the new president should not lead to forgetfulness of the very capable gentleman whom he succeeds. For more than two years, Mr. Hodgman has lived with and for the Rubber Club. His concentrative attention to detail, his courtesy, his full appreciation of the work of others have left an impress for good upon the association that will not soon be effaced. None the less sincere because unspoken, he has the confidence and thanks of the whole trade.

CRUDE RUBBER DISTRIBUTION.

BASED on the estimates of the distribution of crude rubber that appeared in our February issue, a comparison between 1915, a war year, and 1913, a peace year, shows some very interesting facts.

England in 1915 received 33½ per cent more rubber than in 1913, Germany and Austria 82 per cent less and France 22 per cent less. Russia showed an increase of 39 per cent and the United States and Canada together gained 90 per cent. The world's total crop in 1915 was 38 per cent larger than in 1913, a most satisfactory increase.

Statistics are very useful as an aid in determining probabilities if all important factors are obtainable. If not, deductions made are not only useless, but sometimes lead to absurd conclusions. For example, suppose one should take the percentages of increase or decrease above as a means for calculating the distribution of rubber in 1925.

Figured thus, England would consume over 100,000 tons of crude rubber. Germany and Austria, by the same process, would distribute two-thirds of a ton between them, and France's apportionment would be 2,000 tons. Russia would get about 80,000 tons, Italy, 50,000 tons, and 128,000 tons would be divided between Japan and Australia. The United States and Canada, by the same reasoning, would obtain 2,216,000 tons, about 25 times the 1915 receipts.

The percentage of increase in plantation and wild rubber for the two years shown above is 38 per cent, which would give for a world product in 1925 (perhaps) 730,000

tons, or less than one-third of the total which the United States and Canada together are estimated to receive. *Reductio ad absurdum.*

THE PROPOSED TARIFF COMMISSION.

TARIFFS up to this time, with the exception of the Act of 1883, have been the work of the Ways and Means Committee of the House of Representatives, assisted in a greater or less degree by business men. Then going to the Senate, these measures were recast and often greatly changed by its Finance Committee. Finally, a conference committee of the two bodies made additional revisions and compromises so that the bill could receive the approval of Congress. The resulting measures have generally been inadequate, unbalanced, and abounding in incongruities that brought justice to neither manufacturer nor consumer.

During the past few years a strong movement has developed to take the tariff out of politics. Business men and some politicians have concluded that more deliberate and exact knowledge was requisite for the proper enactment of future tariff legislation. The war has brought home the realization that, when peace is again declared, prompt measures will be needed to meet the changed conditions and to properly guard the interests of American producers.

With the approval of President Wilson, Representative Rainey of Illinois, the ranking Democratic member of the Ways and Means Committee of the House, has introduced a bill providing for a commission of five members, not more than three of whom shall be of the same political party. This measure, which the best opinion in Washington expect will become a law before the end of the present session, gives broad powers for the investigation of customs laws and their effects and on all questions relating to tariffs, with a view to arrangement of schedules. Commercial treaties, statistics, and unfair foreign competition are among other subjects to be looked into.

The unusual powers of examination and investigation, as proposed in this bill, have rightly met with some criticism, such as, "The right to copy any documentary evidence of any person * * * engaged in the production, importation or distribution of any article under investigation * * * and to require any person * * * to produce books or papers." The production of documentary evidence and the attendance of witnesses under the terms of the bill may be

required "from any place in the United States to any designated place of hearing." Penalties are provided to enforce compliance.

Manufacturers of rubber goods, like those in other lines, will not endorse the features of this bill that make attendance at hearings compulsory and that require the opening of their books to the commission whenever demanded. They will, however, be glad to have the next tariff adjustment made on an intelligent and scientific basis.

The creation of a permanent tariff commission is a step in the right direction. Some day, perhaps, its powers will be extended to the fixing of tariff rates, somewhat in the way that the Interstate Commerce Commission determines transportation charges. Then the tariff commission, if judiciously conducted, should prove a power for developing an increased national prosperity and would prevent the unfortunate business slumps that usually accompany tariff revisions.

THE GOLF BALL.

THE golf ball as used for centuries was made of feathers compressed within a leather case. Then for a few decades solid gutta balls were generally used. They were good, but better were demanded, and America supplied the need.

The feather ball had a peculiar slow resilience that helped to secure long flight; the gutta had a better slow rebound; but the stretched rubber threads of the "Haskell" gave a slow resilience, better than that of its predecessors.

The Haskell patent expires next month and this country is threatened with an invasion of English-made balls. How seriously this will interfere with the American product is a question.

When the Haskell ball was invented, there was comparatively little golf played here. Now, Jerome D. Travers, the national open golf champion, estimates there are 1,300 golf clubs in the United States with a combined membership of 350,000. He says that the average player spends \$20 a year for balls—a total of \$7,000,000.

Assuming that the average golf ball costs 50 cents, 14,000,000 balls are required annually to supply American players alone. And golf is becoming more and more popular every year.

The amount of tire scrap is increasing—183,000 tons of casings and tubes are estimated for the United States this year.



SIXTEENTH ANNUAL BANQUET OF THE RUBBER CLUB OF AMERICA, INC., AT THE WALDORF-ASTORIA, FEBRUARY 2, 1916.

The Rubber Club's Sixteenth Annual Banquet.

"PREPAREDNESS" was the keynote of the gathering, the talk of the diners and the principal topic of the excellent after-dinner speakers at the sixteenth annual banquet of The Rubber Club of America, Inc., which was held in the Myrtle Room of the Waldorf-Astoria, New York City, on Wednesday evening, February 2.

Most of the same leaders in the rubber industry who have attended the previous dinners were present, but the number of diners was increased to 288, nearly 100 more than assembled in the same place in 1914. Many of the members had come from long distances to attend the function, whose influence was to weld closer friendships and promote mutual good will.

The diners met in a reception room and many reunions of friends were witnessed before the banquet was served. On entering the banquet hall, decorated with American flags, the guests found at each place souvenirs in the form of a silk American flag and a silver pencil, and also an attractive programme and menu on the front of which was handsomely embossed an American flag.

After an invocation by the Rev. George R. Van De Water, D. D., the diners enjoyed an excellent repast and enthusiastically participated in popular and patriotic songs.

TOASTS TO THE DEFENDERS.

After the dinner Ex-President Hodgman proposed three toasts: one to the President of the United States, another to "our first line of defense, the United States Navy," and the third to "our next line of service, small but willing to grow, the United States

Army." These were drunk with much enthusiasm and great applause.

He then read a cablegram of kindly greeting and good wishes from the chairman and council of the Rubber Growers' Association and a telegram from Dudley Field Malone, collector of the Port of New York, regretting that official business had called him from the city.

MR. HODGMAN'S ADDRESS

Ex-President Hodgman continued with the following address to the assembly:

Since our last banquet two years ago, history has been in the making at a rapid rate, more so than ever before in the memory of man. When we met together before, the whole world was at peace; now over one-half of it is plunged in war.

In these days of the supposedly higher civilization, it almost seems impossible that this should be, but we have evidence on every side that it is only too true, and our own country, although remote from the scene of actual hostilities, cannot but feel the influence of the conflict which is raging on the other side of the earth.

Our own industry, like many others, has been affected, for we have seen during the past 18 months practically all of the raw materials which enter into the manufacture of our products increase in price, some to an unprecedented degree, and there have been times when the uncertainty of procuring the necessary supplies to run our mills has been very acute.

This all goes to prove that, in spite of the immense resources of the United States, there are industries, such as ours, which are entirely dependent upon foreign sources for the essentials which enable us to make our livelihood. While this is a situation which in the nature of things cannot be remedied, it certainly furnishes much food for thought.

In the crisis which arose in the latter part of 1914, when it seemed possible that we might be deprived of the greater part of our supply of crude rubber, because of the activities of the Rubber Club of America this peril was averted, which clearly shows that an organization such as ours is a real necessity, and not only in a crisis like this, but in many other ways can serve and foster the industry which we represent.

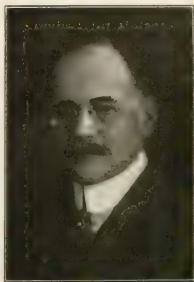
While the United States has been, and we fervently hope will remain, at peace, yet we cannot but give serious attention to the lessons which the great conflict in Europe has taught us.

To the vast majority of the people, two years ago, the thought of such a war was impossible, almost unbelievable, but nevertheless the war *did* come, and has developed into the most stupendous conflict of the ages. As the unbelievable has once happened, who can now predict that it may not happen again, and some time involve this fair land of ours?

With these facts before us, it behooves us as a nation to awaken, and place ourselves where we will be able with full confidence adequately to defend ourselves against a foreign attack, and not subject ourselves to the humiliation which in our present defenseless condition would be inevitable.

I, therefore, fervently hope that the patriotism, which has shown itself in crises in the past, may rise again to the same lofty heights, and that we as a people, irrespective of party or creed, may make it our absorbing purpose to let nothing stand in the way of preparing ourselves to defend our country and our flag against the worst that may come.

In this worthy cause the rubber industry of the United States should do its part, and I trust that the action taken



GEORGE B. HODGMAN.
Ex-President.

MENU

<p>"Some have said who cannot eat, Some said not who want it, And so the Lord be thanked!"—BURNS</p>	
Smith Island Oyster.	Clysmic
<p>"Oysters is like all other human here—some is good and some of 'em is bad!"—ANDRO</p>	
Cream of Celery aux croutons	
Raspberries	Olives
	Celery
	Almonds
<p>"To him and his allies at the same time is not easy to be done!"—PLAUTUS.</p>	
Medallion of Sea Bass, à la Joinville	
Cucumber Salad, French Dressing	
<p>"Fishes live in the sea as men do abroad, the great ones eat up the little ones!"—SHAKESPEARE</p>	
Fresh Mushrooms under Glass	Graves Superior
<p>"Can we ever have too much of a good thing?"—CHRYSTIAN.</p>	
Mignon of Lamb, Colbert Sauce	
Potatoes Laurette	
<p>"The discovery of a new dish does more for the happiness of a man than the discovery of a new star!"—BELLAT SAVANIN</p>	
Grapefruit Maraschino	
<p>"A moral for a monarch!"—SHAKESPEARE.</p>	
Roasted Philadelphia Squabs on Toast	
Hearts of Lettuce, Russian Style	
<p>"Everybody is getting roasted nowadays, why not a 'squab' also?"</p>	
Borbhe of Chestnuts glacée	
<p>"Then ferreted head and welcome feast!"—MERCHANT OF VENICE.</p>	
Assorted Cakes	
<p>"I am glad that my Almas has a good tooth in his head!"—LIVY.</p>	
Coffee	
<p>"Coffee—how indefinite a word! It means so much or so little!"</p>	
Cigars	Cigarettes

RECESSIONAL

"Good night. My feet are cramped and my eye is blind!"—SHAKESPEARE.
"Now I find with under and not with wine!"—BURN JOHNSON.

Reader
Grand
Via Sec

at our annual meeting this afternoon will merit the hearty approval and receive the enthusiastic support of our membership.

Although this is a social and not a business occasion, I wish at this time to extend my appreciation for the cordial support which has aided me during my term as president of the Rubber Club of America. I bespeak for your new president the same cooperation and consideration which you have given me.

Many of the attempts to regulate our business affairs by Congress, during the past decade, have been based upon theory rather than on facts. The Federal Trade Commission is making a serious effort to secure actual facts concerning business on which intelligent legislation may be based, and at the same time is in position to advise the manufacturer or merchant on any proposed action which might be open to question.

EDWARD N. HURLEY ON THE FEDERAL TRADE COMMISSION.

Edward N. Hurley, vice-chairman of the Federal Trade Commission, after calling attention to the fact that the Rubber Club, as a strong and active organization, had grasped the modern idea

of collective business effort, told of ways in which the commission hoped to assist American industries. Then, speaking regarding the conditions in manufacturing industries he said, in part:

In a brief survey which we made of a typical manufacturing industry, which is well and favorably known and sells its product in every state in the Union, figures received, covering the year 1914, showed that 27 of the larger manufacturers, all shipping over \$100,000 worth of goods a year, with an aggregate capital stock of \$9,000,000, bonds and other indebtedness of \$3,500,000, and total sales of \$8,500,000, had a net income of only \$300,000, which is three and one-third per cent on the capital stock, or three and one-half per cent

Black & Alexander

HON. EDWARD N. HURLEY.

on the sales. This does not indicate a very profitable business.

The most striking feature which appeared, however, was the fact that these concerns, with a total investment of about twelve and a half million dollars, and net sales of eight and a half millions, charged off only \$69,000 for depreciation. Furthermore, this amount was charged off by 12 of the 27 concerns, which represented an investment of four and a half million dollars and sales of four million dollars. The other 15 concerns, with an investment of eight million dollars and sales of four and a half million dollars, did not charge off one penny for depreciation. This example is typical of other industries. Similar conditions have existed in many lines for years.

Leaving out of consideration the banking, railroad and public utilities corporations, and referring only to those that have to do with trade and industry, we find that there are about 250,000 business corporations in the country. The astonishing thing is that over 100,000 of these report no net income whatever. In addition 90,000 make less than \$5,000 a year, while only the 60,000 remaining, the more successful ones, make \$5,000 a year and over.

In tabulating the data for the large and successful corporations in the United States, comprising all the corporations doing a business of \$100,000 a year or over, we found that, out of a total of 66,000, 30,000 charged off no depreciation whatever.

How can the Federal Trade Commission help to improve conditions?

The Commission has no intention and no desire to use compulsory methods. But it does hope to reach the desired end by encouraging improvements in accounting practice, by indorsing standard systems of bookkeeping and cost accounting, and by assisting in devising standard systems, either at the request of individual merchants and manufacturers or through the association that represents the industry.

We must get down to the hard facts of business, to learn precisely what they are, where the weakness and losses exist, and practice the same thoroughness which characterizes trade and industry in Europe. We must be improving our methods of production, changing our designs to meet the new conditions both at home and abroad, and always endeavoring to adopt some new method that will reduce the cost of operation. We also need to standardize our products and processes.

In Germany every important industry is organized into trade associations and 85 per cent of the manufacturers engaged in those industries are represented in their respective trade associations. More than 600 independent associations of manufacturers, producers and merchants exist in Germany today and besides the entire industrial system of that country is honey-combed with about 5,000 subsidiary business organizations.

The war has brought to us great opportunities and equally great dangers. The thought that we must keep in mind is: "After the war, what?" Shall we grow and expand while the growing is good, or calmly wait the time when peace in Europe will be followed immediately by keen competition not only in foreign markets, but in our domestic markets as well?

Let us seek better organization and greater efficiency at home; let us push our trade abroad; let us develop our industry so strongly that no foreign competition can dislodge it. Industrial preparedness must be our watch-word.

HENRY D. ESTABROOK ON PREPAREDNESS.

Henry D. Estabrook, of New York, was introduced and made a strong and eloquent plea for preparedness, extracts from which follow:

I would rather scrap every gun and warship we own, if we are not going to add to them, for if we were without strength to repel invasion, we could at least plead the privilege of the weak and surrender with discretion, and rely on the moral claim on the part of the invader, but to fight half-armed and with a certainty of losing would be nothing short of murder for which you and I and every taxpayer in the United States would be measurably responsible.

We are admitted no alternative. We must spend money for defense forthwith, and lots of it. We must know we are safe even from the temptation of attack. Our peace and future happiness depends upon it.

"To prepare for war," said Washington, "is one of the most effective ways of preserving peace. A free people should not only be armed, but disciplined. To that end a uniform and well digested plan is requisite."

This plan should come from our military experts. In so far as their recommendations were unanimous, they should be adopted without much debate, and regardless of cost, with the understanding always that the sole purpose to be subserved is defense and not aggression.

This obviously means a big navy, as big as any navy in the world, with every flying, diving, amphibious auxiliary that can add to it. It means ammunition to boot, ammunition, at least, for a year's campaign always in cold storage. It means enough officers and men easily to operate the machinery of the government. And, inasmuch as this machinery will be complicated and scientific, it means officers and men of technical training and brains. Men like these can always obtain lucrative employment in civil lines. The government must outbid that market.

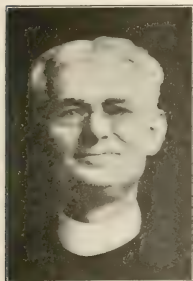
Insurance costs money. America has more things of value to insure, and more money to pay the premium than any nation in the world.

There is no better auxiliary to a navy than a merchant marine, nor is there any instrumentality that adds more to the riches and glory of a nation. Time was when our flag covered the seven seas; when the ocean highways, costing nothing for repairs, were as much ours as England's.



HENRY D. ESTABROOK.

The government cannot compel Americans to build ships. The government can only tempt and coax them. The cheapest encouragement it can offer is to permit them to compete on an even keel with the shipowners of the world. If to do this involves subsidies, then the government must equalize conditions of sea with the ships.



REV. W. WARREN GILES.

millions of men who do not know a quick-firing gun from a ton of coal. We have some good soldiers sometimes, but they are not good soldiers to-night.

The thing that burdens me more than anything else today is our loss of chivalry. As a nation we have no national ideals. Over in Germany they are all Germans; in France, all French; if you go into Canada tonight you won't find a thing but Canadians; and less than nine millions are able to raise an army of five hundred thousand men; and you may be assured they are good soldiers.

But in this country tonight we have Anglo-Americans, and German-Americans, and we have French-Americans, and



HON. HARRY M. DAUGHERTY.

HON. HARRY M. DAUGHERTY
ON COMMERCIAL PRE-
PAREDNESS.

The Hon. Harry M. Daugherty, of Columbus, Ohio, was introduced by Ex-President Hodgman as standing for "bread, butter and business; also for peace, protection and prosperity." Mr. Daugherty called attention to the fact that during recent years envy, avarice and suspicion had grown throughout the world.

After a broad review of the political situation, he said:

Coming from Ohio and seeing here tonight men who come from my proud state, I can say to you that Ohio is in favor of an ample preparedness, of the establishment of a merchant marine, and in lending governmental aid and assistance to the construction of utilities upon the oceans that will carry American trade to every market in the world.

We are in favor of enacting such laws as will take care of the situation in this country industrially when this war is over, of protecting America and American capital and American labor.

I do not tonight have any fear of an attack upon us, yet to avoid any attack I believe in preparedness, but when this war is over, the invasion that we had better look after is the industrial invasion. Every soldier on the battlefield

THE REV. MR. GILES PRO-
VOKED MUCH GOOD HUMOR.

The Rev. W. Warren Giles, of East Orange, New Jersey, who has the well earned reputation of being one of the most entertaining after-dinner speakers in the country, followed Mr. Estabrook with an address full of rare wit and humor intermingled with serious and thoughtful appeals for adequate preparedness. Referring to this subject, he said:

It is foreign invasion that I am afraid of, and I do not know of anything to prevent it, that I have seen on this side of the ocean, as yet. Certainly not an army of fifty thousand men, certainly not a quick-firing gun from a ton of coal. We have some good soldiers sometimes, but they are not good soldiers to-night.

and in the trenches in this war, when he returns to his devastated country, will go into the mills and shops and work for wages lower than he ever worked for before and the foreign manufacturer will be willing to sell cheaper than he ever sold before, and ours, excepting his own home market, will be the greatest market in the world. We will have the money, and this is the market they will invade.

MAYOR MITCHEL IS FOR A CITIZEN RESERVE.

John Purroy Mitchel, mayor of New York City, the next speaker, pointed out that regardless of how high the devotion of a people for peace or how high a nation stands for justice, that it is a fundamental duty of every citizen to take such steps as will secure peace and perpetuate the institutions that have been built up. He then made a strong plea for preparedness, in which he said in part:



HON. JOHN PURROY MITCHEL.

warfare comes that is inevitable, defending American interests at home and abroad a navy that will be second to that of no other nation.

However good our navy, however effective our coast defenses, every military and naval expert will tell you that we must have at least the material out of which an effective mobile army can be made within a reasonably short period of time. That material does not exist today. We have the barest nucleus of a standing army. We have at the utmost, with standing army and militia combined, not more than ninety thousand effective troops who could be put in the field today, and behind that today there is no citizen reserve. We ought to have federal control over the national guard.

CAPTAIN ERNEST E.
BUCKLETON.

CAPTAIN BUCKLETON ON THE BELGIAN CONTRIBUTION.

Captain Ernest E. Buckleton, president of the Northwestern Rubber Co., Liverpool, England, who was relieved from service at the front when injured by the explosion of a mine, was asked by the toastmaster to speak. Referring to the contribution made last year by the Rubber Club for the Belgian refugees, he said:

I would like to take this opportunity first of expressing to you the thanks of the Belgian refugees in Liverpool for the magnificent gift which the members of this Club, collectively and individually, sent to me last year to be used on their behalf.

There are a great many of you perhaps that do not know

that a number of refugees came to Liverpool, and when I was over here in 1914, I made a remark to Mr. Pearson, of THE INDIA RUBBER WORLD, that it was my intention to do what I could for them. He took up the matter with the members and they made a most generous gift, which I can assure you has been thoroughly appreciated by those poor refugees. It has enabled me with the help of a great many other friends to take care of 30 or 40 women and children of the best class of Belgium who were forced to come to England on account of the war in their country.

THE "GAS MASK."

I am only a rubber manufacturer, but the rubber industry has enabled the world to help the unfortunate soldiers at the front, who are fighting today for what each one considers his duty and his right.



Photo Underwood & Underwood.

THE RUBBER GAS MASK.

The mask (shown in the accompanying illustration) is used to neutralize the chlorine gas used by the Germans in their attacks. They have it stored in large cylinders and at a favorable opportunity this gas is discharged and comes along in a low cloud. Immediately the discharge takes place, every soldier immediately puts on his helmet and he lives with it. He is never in the trenches without it. Perhaps the most curious sight in the world is to see a battalion with these helmets on.

The rubber industry is to be congratulated in being able to produce something which has saved the lives of thousands and thousands of men.

THE MEMBERS AND GUESTS. PRESENT.

At the President's Table.

Daugherty, Hon. Harry M. Mitchell, Hon. John Purroy
Estabrook, Henry D. Pinheiro, Hon. H. C. De M.
Giles, Rev. W. Warren Pratt, Dr. E. E.
Hodgman, George B. Usher, Rear-Admiral N. R.
Hurley, Hon. Edward N. Van De Water, Rev. Dr. G. R.

Alphabetical List.

A
Achelis, F. G.
Allen, W. R.
Anderson, E. A.
Anderson, F. C.
Arnold, C. H.
Arnold, W. H.
Ashcroft, R. W.
Austin, F. G.

B
Babcock, F. H.
Bachman, R. A.
Badenhop, Robert
Bainbridge, W. T.
Baird, R. B.
Baird, R. L.
Baird, William T.
Barker, William E.
Barnard, H. H.
Barnard, Arin A.
Barnes, Charles W.
Bass, Walter H.
Bass, William F.
Bassett, Theodore W.
Basten, Otto
Bechton, H. W.
Bedell, Harold H.
Belchen, Edwin W.
Bers, Aaron
Blackwell, Wilson H.
Bourn, A. O.
Bourn, A. O., Jr.
Bowman, W. P.
Boyer, H. L.
Braender, Fred
Brinckerhoff, E. A.
Broadhead, Garrett, Jr.

Broadwell, E. H.
Broughton, J. S.
Brown, Andrew H.
Brown, William Harman, Jr.
Bruyn, William E.
Bryant, George G.
Buckleton, Captain E. E.
Byles, W. E.

C

Caldwell, R. J.
Campbell, Phillip H.
Candee, Charles N.
Carberry, John D.
Cartmell, Van H.
Case, C. C.
Chandler, John J.
Chichester, Ira
Chipman, R. L.
Clark, M. H.
Clyden, A. L.
Cobb, J. H.
Coe, C. A.
Cole, William T.
Coleman, T. L.
Conant, Richard G.
Cone, Charles A.
Cone, Frederick H.
Conlin, A. J.
Cornell, A. Boyd
Cottle, George
Coughlin, E. J.
Coughlin, Thomas
Coughlin, T. B.
Cummings, E. O.
Cummings, H. H.

D

Daugherty, Hon. H. M.
Davis, J. Edwin
Daval, Charles J.
Devine, Charles F.
Devine, Joseph P.
Dickerson, W. H.
Dickinson, F. S.
Dickson, F. S.
Dods, Samuel H.
Dreckmeier, F. W. L.
Drisler, W. A.
Dumont, L. W.
Dunsford, S.
Duryea, A. R.

E

Eagles, R. P. M.
Estabrook, Henry D.

F

Faber, Eberhard
Faber, Lothar W.
Feinburg, D.
Fera, Henry, Jr.
Fields, John J.
Fields, John J., 3d
Fields, Richard K.
Firestone, Harvey S.
Fisk, H. G.
Fox, F. F.
Francis, Arnold W.
Fulkert, Charles
Fuller, H. P.
Fulper, E. B.
Funk, A. S.

G

Gardner, George A.
Gardner, T. M.
Garretson, C. D.
Garthwaite, O. A.
Gaskill, J. W.
Giles, James F.
Giles, Rev. W. Warren
Greene, N. Lincoln

Greenough, A. B.
Grieb, William G.
Goldman, H.
Grosscup, Judge P. S.
Gunn, J. Newton

H

Hall, George E.
Harrison, Clark
Haynes, Charles R.
Henderson, B. W.
Henderson, F. R.
Hering, H. F.
Hewins, E. D.
Hichborn, George F.
Himebaugh, L. C.
Hodgman, George B.
Hodgman, S. Theodore
Holcombe, H. W.
Hood, Frederic C.
Hopkinson, E. B.
Hotchkiss, H. Stuart
Hubbard, H. B.
Huber, Edward E.
Hunter, Joseph H.
Hurley, Hon. Edward N.
Hutton, Wallace
Hydes, Thomas
Hopper, C. C.

J

Jacoby, Ernest
Jeandheur, George E.
Jenkins, H. W.
Johnson, Allen F.
Johnstone, James T.
Jones, Frederick H.

K

Kearns, John
Kelly, J. H.
Kelly, W. J.
Kelly, Dr. W. J.
Kent, R. W.
Kenyon, C. Jr.
Kenyon, George
Kittle, F. L.
Koehn, Alfred C.
Korn, E. C.

L

LaDow, Jesse E.
Lahey, Frank
Lambert, J. A.
Laurie, J.
La Mont, F. Jr.
Lamont, Sloan, Jr.
Lewis, George W.
L'Hommedieu, S. Y.
Litchfield, P. W.
Littlejohn, Robert M.
Logan, William V.
Lowman, J. S.
Ludington, George A.
Lynch, Charles

M

McCallum, Fred
McGraw, R. W.
McKay, C. B.
McKenna, Drew
McLean, Joseph F.
MacKusick, H. A.
MacMichael, L. P.
Macomb, J. W.
Manchester, A. A., Jr.
Marcus, A.
Marshall, Thomas C.
Marland, W. H.
Martin, B. T.
Maurer, Edward
Maurer, Edward J.
Mayo, George H.

Meyer, Adolph
Meyer, Otto
Meyers, A. C.
Meyers, Sidney S.
Miley, C. E.
Miller, Joseph A.
Mitchel, Hon. John Purroy
Montgomery, Henry
Morgan, John
Morse, William M.
Muehlstein, Herman
Muehlstein, J.
Murray, James A.
Myers, F. E.

N

Naylor, R. H.
Neil, Edwin M.
Newcombe, Richard S.

O

Odell, James E.
Owens, R. J.
Oakley, C. H.
Obalski, X. W.

P

Page, Wallace G.
Park, Edgar
Parker, J. R.
Parker, Russell
Parsons, W. Guy
Pearce, H. C.
Pearson, Henry C.
Pell, George E.
Perlish, Henry
Pfeiffer, William
Pinheiro, Hon. H. C. De M.
Pitcher, W. L.
Place, Charles A.
Place, Charles H.
Plumb, L. J.
Pratt, Archer
Pratt, Dr. E. E.
Price, R. B.
Proctor, L. B.
Procter, William L.
Pusinelli, Fred

R

Rector, Dr. Joseph M.
Reed, Henry D.
Rice, R. L.
Robertson, Thomas L.
Robertson, J. G.
Roebeling, K. G.
Rutherford, W. O.
Ryckman, W. G.
Roe, Mark W.
Reeve, Arthur

S

Sachs, Adolph R.
Sachs, Robert Paul
Sawyer, Homer E.
Schieren, G. Arthur

Schwab, F. M.
Seward, T. J.
Shreve, J. Nelson
Skinner, J.
Smith, A. W.
Smith, Herman E.
Smith, H. W.
Smith, P. G.
Smith, R. G.
Spencer, R. F.
Stearn, E. W.
Stiles, Lynn D.
Stiles, William H.
Stephens, William
Stokes, Charles E.
Stokes, R. J.
Sweeney, E. C., Jr.

T

Talen, F. A.
Thalheimer, Albert F.
Thomas, J. W.
Thomas, L. H.
Thompson, Kennedy M.
Taylor, M. C.
Tweedy, O. S.
Ticknor, W. D.

U

Usher, Rear Admiral N. R.

V

Van Alst, Milton
Vance, L. T.
Van Cleve, George B.
Van Der Beck, Frank A.
Van De Water, Rev. Dr. G. R.
Van Etten, J. D. C.
Van Kleeck, Chester
Vincent, R. W.
Von Schlegel, V.
Voorhees, Frank D.
Vorhis, H. S.

W

Warren, A. W.
Watkinson, George
Weida, H.
Weitling, William W.
Welton, Spencer
Whitehead, Alfred
Whitehead, Richard R.
Whitnack, W. A.
Whittelsey, Dr. T.
Weis, George A.
Williams, Elisha S.
Wilson, Charles T.
Wood, Charles E.
Woodard, S. P.
Woodbury, R. B.
Woodward, F. R.
Wright, Samuel

Y

Young, Philip E.
Yule, W. H.

MEETING OF RUBBER SUNDRIES MANUFACTURERS' DIVISION.

The Rubber Sundries Manufacturers' Division of The Rubber Club of America, Inc., on February 2 held its annual meeting at the Waldorf-Astoria and re-elected the following officers for the ensuing year: Russell Parker, Parker, Stearns & Co., chairman; Charles J. Davol, Davol Rubber Co., vice-chairman; Harry S. Vorhis, secretary and treasurer. The members of the executive committee of this division are as follows: Russell Parker, chairman; Charles J. Davol; George B. Hodgman, Hodgman Rubber Co.; W. O. Rutherford, The B. F. Goodrich Co.; Frederick H. Jones, Tyer Rubber Co.; A. C. Eggers, Good-year's India Rubber Glove Manufacturing Co.; E. E. Huber, Eberhard Faber.

MEETING OF MECHANICAL RUBBER GOODS MANUFACTURERS' DIVISION.

The Mechanical Rubber Goods Manufacturers' Division held its meeting on February 2 at the Waldorf-Astoria, and re-elected the following officers: William T. Cole, Fabric Fire Hose Co., chairman; John J. Voorhees, Voorhees Rubber Manufacturing Co., vice-chairman; Harry S. Vorhis, secretary and treasurer. The executive committee membership is as follows: William T. Cole, chairman; C. C. Case, Revere Rubber Co.; George E. Hall, Boston Woven Hose & Rubber Co.; J. H. Kelly, Republic Rubber Co.; C. Edward Murray, Empire Rubber & Tire Co.; W. O. Rutherford, The B. F. Goodrich Co.; Henry Spadone, Gutta Percha & Rubber Manufacturing Co.; John J. Voorhees; George A. Wies, Eureka Fire Hose Manufacturing Co.

THE RUBBER CLUB GAINS MANY MEMBERS.

ANNOUNCEMENT has been made of material increase in membership of The Rubber Club of America, Inc. The firms together with the firm representatives are given below:

FIRM MEMBERS

Akron Rubber Mold & Machine Co., 917 Sweitzer avenue, Akron, Ohio; S. W. Harris.
Alden, Frank G., 29 Broadway, New York City.
Asbestos & Rubber Works of America, 1790 Broadway, New York City; Edward H. Garcin.
Batavia Rubber Co., Batavia, New York; W. P. Berrien or A. W. Caney.
Boston Yarn Co., 60 Federal street, Boston, Massachusetts; A. B. Greenough.
British-American Manufacturing Co., Springdale, Connecticut; L. C. Himebaugh.
Delion Tire & Rubber Co., Trenton, New Jersey; H. H. Coleman.
India Rubber Co., New Brunswick, New Jersey; Raymond B. Price.
Otto Iseinstein & Co., 90 Wall street, New York City; Otto Iseinstein.
LaCrosse Rubber Mills Co., LaCrosse, Wisconsin; A. S. Funk.
Mexican Crude Rubber Co., 625 Penobscot Building, Detroit, Michigan; Walter E. Parker.
National Rubber Co., 284 Hanover street, Pottstown, Pennsylvania; J. G. Feist.
Pharis Tire & Rubber Co., West Main street, Newark, Ohio; Carl Pharis.
Swinehart Tire & Rubber Co., 21 West North street, Akron, Ohio; Thomas F. Walsh.
Taylor, Armitage & Co., 346 Broadway, New York City; R. P. M. Eagles.
Werner & Pfeleiderer Co., 41 Park Row, New York City; F. H. Banbury.
Winter Son & Co., 64 Wall street, New York City; Arthur E. Winter.

ASSOCIATE MEMBERS

Parker R. Browne, Boston Rubber Shoe Co., Malden, Massachusetts.
Frank L. Slazenger, 12 East 43d street, New York City.
Alpheus W. Smith, 819 Royal Insurance Building, Chicago, Ill.
W. B. Stewart, Allcock Manufacturing Co., 274 Canal street, New York City.
Samuel Wright, 706 Fayette street, Conshohocken, Pennsylvania.

RETIRING EXECUTIVE COMMITTEE AND DIRECTORS MEET.

On February 1 a meeting of the executive committee of the Rubber Club was held at the Union League Club, New York City, with the following members present: President, George B. Hodgman; Frederic C. Hood, Henry Spadone, William E. Bruyn and Van H. Cartmell. Raymond B. Price, chairman of the temporary committee on preparedness, the other members of which were Bertram G. Work, Colonel Arthur F. Townsend and John K. Mitchell, rendered an interesting report.

The committee then met with the board of directors, the following being present at this meeting: Augustus O. Bourn, William E. Bruyn, Harry G. Fisk, George E. Hall, George B. Hodgman, Frederick H. Jones, William J. Kelly, Henry C. Pearson, Henry Spadone and Elisha S. Williams.

The Annual Meeting of The Rubber Club of America, Inc.

THE annual meeting of The Rubber Club of America, Inc., was held on February 2 in the Myrtle Room of the Waldorf-Astoria, New York City.

After the reading of the minutes of the previous meeting, President George B. Hodgman presented the following interesting report, in which the activities of the club are described in detail:

REPORT OF THE PRESIDENT.

At the end of my term as your president, I submit for your consideration the official report due from me, as a mere outline of the accomplishments of your organization.

To your Board of Directors, to your Executive Committee and to the Rubber Control Committee is especial credit due for what you may find of merit in the transaction of the past year, such as increasing membership benefits, broadening the scope and work of the organization, and adding to its prestige and standing in trade circles. In this work you have had the gratuitous services of responsible men of affairs, singularly disinterested in their efforts to advance this organization to a position of dignity and worth in the commercial world. Since the last annual meeting of the Rubber Club, on April 21, 1914 (as our meeting of 1915 was omitted owing to the radical changes in our organization), the story of our progress is replete with interest.

Rubber Embargo:—The most important event during this period was the placing of the embargo by Great Britain on plantation rubber produced in her colonies. This unforeseen and sudden action brought consternation to our manufacturers, who saw before them the possibility of crude rubber supplies being so materially reduced that serious hardship would be imposed upon the industry, and in the light of subsequent events, to which I shall only briefly refer, the necessity and worth of your organization was proven.

Following the embargo, your Executive Committee appointed a committee of four, consisting of A. H. Marks, W. E. Bryn, H. Stuart Hotchkiss and myself, to whom was delegated the task of endeavoring to find some means to alleviate the situation. This committee made frequent visits to Washington, covering a period of two months, and there made dignified representations to the State Department and to the British Embassy, and also co-operated with the Rubber Trade Association of London. B. G. Work also made a special trip to England, as a representative of the Rubber Club of America.

In the month of January, 1915, Great Britain raised the embargo on rubber, but because of the war, her necessities and her control of the situation, she dictated and imposed the conditions under which manufacturers were to secure their supplies. She devised a system whereby permits were issued in London for the shipment of rubber to the United States, consigned to the British Consul-General in New York, where such shipments were only to be released in consideration of the manufacturers and importers giving individual guarantees binding themselves not to export crude rubber, or manufactured, or partly manufactured rubber goods to the enemies of Great Britain, and also binding themselves to observe other requirements in respect to the shipments of manufactured goods to other countries.

The details necessary for the recording of guarantees and tracing the shipments covered thereby were found to be of such a cumbersome nature that the British Consul-General at New York requested the Rubber Club of America to assist him in the handling of this matter. Accordingly, and with the acceptance of this work by your association, it was deemed necessary to enlarge our facilities to meet increasing activities. We therefore moved from our small quarters, at 17 Madison avenue, to 17 Battery place, where we have an office sufficient in size and a clerical force sufficient in number to handle the great volume of business. Your Board of Directors also deemed it advisable to constitute and appoint a committee whose duties would be to keep in touch with this work and to assist in clearing any possible misinterpretations of the letter and spirit of the British rubber guarantee.

This committee is known as the Rubber Control Committee. The problems which it has been called upon to meet have been many and intricate, and have called for the exercise of the utmost care and judgment. Violations of the terms of the British rubber guarantee have occurred, as was to be expected, but the British authorities are apparently assured that, in spite of them, the great mass of American manufacturers and importers are fulfilling their promises.

The rubber embargo was one of the most serious situations that ever threatened the American rubber industry. Its subsequent modification, however, makes it possible for us to secure our supplies of rubber. I cannot tell what future conditions in this connection will be, as new complications, due to the war, may arise. Considering, however, the abnormal and extraordinary conditions existing during 1915, we have little cause for complaint.

The members of this committee, often at the sacrifice of their personal and business interests, have given freely of their time, and are truly discharging a most important and unselfish service—how important and unselfish will only be realized when this great war is at an end and the complete history of the rubber embargo has been written.

Reorganization:—When the Rubber Club of America adopted its constitution and by-laws at a meeting in April, 1913, it was thought that adequate provision had been made to carry out the purpose and objects of the club as a business organization. After our main office had been established in New York City, and it was realized that we were to occupy a more important position in the commercial world, the necessity of possessing broader corporate powers became plainly apparent. With the assumption of the duties incident to the British rubber embargo, this need became imperative.

Under our former charter it was mandatory to hold our meetings in Boston, but as New York became the center of our activities, it was thought advisable to hold our annual meetings there. Accordingly, proper legal steps were taken to annul our Massachusetts charter, and to apply for the charter of a new corporation to be known as The Rubber Club of America, Inc. This incorporation was effected under the laws of the State of Connecticut on March 19, 1915. Its constitution and by-laws were adopted at a meeting held in April, 1915, which gave all of the powers required. Coincident with this reorganization, the annual dues of our members were increased to \$80.00 per year, thus providing a sufficient income to meet our growing needs without, as in the past, levying extra assessments.

Legislation:—For the purpose of protecting the interests of the rubber trade against legislation, which might seriously and unjustly affect it, provision has been made in our new constitution for the formation of a standing Committee on Legislation. The duty of this committee is "to keep in touch with local, state and federal legislation affecting the rubber industry." When, in the opinion of this committee, and its counsel, proposed legislation is deemed to be of special interest to certain members, those affected will be furnished with a copy of the same. Our members are asked to co-operate with this committee, and to advise it of any matters which should be properly brought to its attention.

It is not without the range of possibility that the matter of tariff revision may again come before the country in the next few years, in which case your Committee on Legislation may find a larger field for usefulness. In connection with the tariff, it may be mentioned that our association is on the lookout for undervaluations and improper customs appraisements. I may add that the Rubber Sundries Division secured the adoption by the Board of General Appraisers of a list of such articles as should be entered under the druggists' sundries schedule of 15 per cent, thus clearing misunderstandings under this rather ambiguous schedule.

Group Membership:—In the last annual report I referred to the advantage of group membership, recommending the adoption of a clause in our constitution under which this could be accomplished. Such provision has been made in our new constitution and subdivisions of the manufacturers of mechanical rubber goods and of druggists' sundries have already been formed. These divisions have their own officers and have adopted rules and regulations harmonious with those of the main organization, and each is working out the particular problems which are peculiar to its own line. This division or group plan I consider of great value, and I hope that in the coming year other branches of the trade may join under it. As an example of the benefits of group membership, I may refer to the Credit Experience Bureau, which has been established by the Rubber Sundries Division, and which has proven of great value.

Arbitration:—The subject of commercial arbitration is one which is continually attracting more interest. This method of settling disputes, where decisions are based on submitted facts, has advantages that no one will seriously question. The Rubber Trade Association of New York has provided a plan of arbitra-

tion whereby disputes arising between members in the sale of crude rubber may be adjusted by this very satisfactory method.

It appears to me, however, that facilities for securing arbitration should be made easy and available to all of our members, and I sincerely trust that serious consideration may be given to the amendment of our constitution providing for the formation of

during the existence of the New England Rubber Club. We have continued the very excellent practice of holding a mid-summer outing in New England each year. An outing was held at the Vesper Springs Country Club in July, 1915, which brought together in an informal way many of our members from all sections of the country, and was indeed a successful affair.



HENRY SPADONE.



G. E. HALL.



P. W. LITCHFIELD.



F. H. JONES.

VAN H. CARMELI,
First Vice-President.HARVEY S. FIRESTONE,
President.H. STUART HOTCHKISS,
Second Vice-President.

W. E. BRUYN.



W. O. RUTHERFORD.



C. T. WILSON.



J. S. LOWMAN.



W. J. KELLY.

DIRECTORS OF THE RUBBER CLUB OF AMERICA, INC.

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a Committee on Arbitration, which will furnish the necessary facilities for the settlement of business disputes not only as between manufacturers and importers, but as between manufacturers and those to whom they sell and from whom they buy.

National Preparedness.—The subject of national preparedness is one of the vital topics of the day, and is in no manner a political question. A temporary committee has been formed to consider this important subject, and to report its recommendations.

Social.—The increasing activities of the Rubber Club along business lines have not resulted in any curtailment of the social features in connection with the club, which were so popular

Following the precedent established by many business and social organizations after the outbreak of the present war, we did not hold our annual banquet of 1915, but made contributions through subscriptions to the amount of \$2,623.60 to the American Red Cross, Belgian Relief Fund and other funds for the relief of the sufferers in Europe. Our banquet, which will be held this evening, will, therefore, be the first banquet held since that of 1914, and, of course, the first given under the auspices of our new organization.

Membership.—The Rubber Club has shown a most satisfactory growth in membership since our last annual meeting. At that time, April 21, 1914, we had 66 firm members and 258 active and

associate members, making a total of 324; on January 1, 1916, there were 191 firm members and 227 associate members, making a total of 418. It is significant that firm membership increased nearly 200 per cent. during this period, proving the need of this organization, and a recognition by the trade of its useful work. Unquestionably our future growth as to members will not be as marked as in the past. There are, however, desirable manufacturers who should be brought within our ranks, and each and every member should use his best endeavors to interest any concern whose membership would tend to strengthen our organization. Recent statistics collected by your secretary show approximately 430 rubber manufacturers in the United States.

Legal.—The necessity safely to legally guide your board, officers and committees becomes of increasing importance with the growth of the association. With the creation of your new organization your Board of Directors retained Sidney S. Meyers, Esq., as counsel. To Mr. Meyers our appreciation is due for the very able manner he has handled the association's legal business, but more importantly for his excellent and skillful service in handling many novel and delicate matters submitted by the Rubber Control Committee in connection with the British rubber embargo situation.

Conclusion.—I desire to call attention to the very satisfactory manner in which the work at our office is being performed, and particularly to give recognition to the capable and faithful services of our secretary, Harry S. Vorhis. In the handling of delicate situations Mr. Vorhis has exercised tact and discretion and in the promotion of the usefulness of this organization he has shown untiring zeal. Under his direction all branches of our work are going forward with smoothness and efficiency.

Our appreciation is also due to the members of the Executive Committee for the energy and interest they have shown. The meetings of the Executive Committee have been well attended, despite the fact that some members have been obliged to travel a considerable distance to attend. Due recognition should be given to each member of the committee for his earnest and impartial service in your behalf.

In conclusion I take this opportunity of expressing my deep appreciation to the members of the Board of Directors, to the members of the several committees, and to the membership for their assistance, support and cooperation. On behalf of my successor and your new Board of Directors I ask that they be given the same admirable support and cooperation that has been accorded me.

NEW DIRECTORS ARE ELECTED.

The names put in nomination met with no opposition, and the following is a list of the new Board of Directors, which was elected by unanimous vote:

William H. Bruyn, L. Littlejohn & Co., New York City.
 Van H. Cartmell, Kelly-Springfield Tire Co., New York City.
 Harvey S. Firestone, Firestone Tire & Rubber Co., Akron, Ohio.
 George E. Hall, Boston Woven Hose & Rubber Co., Cambridge, Massachusetts.
 H. Stuart Hotchkiss, United States Rubber Co., New York City.
 Frederick H. Jones, Tyer Rubber Co., Andover, Massachusetts.
 William J. Kelly, Arnold & Zeiss, New York City.
 P. W. Litchfield, Goodyear Tire & Rubber Co., Akron, Ohio.
 J. S. Lowmeyer, Philadelphia Rubber Works Co., Akron, Ohio.
 W. O. Rutherford, The B. F. Goodrich Co., Akron, Ohio.
 Henry Spadone, Gutta Percha & Rubber Manufacturing Co., New York City.
 Charles T. Wilson, Charles T. Wilson Co., Inc., New York City.

NATIONAL PREPAREDNESS.

President Hodgman announced that the question of national preparedness had been called to his attention in such a way that he had taken the responsibility of appointing a temporary committee to consider this matter. This Committee on Preparedness consisted of R. B. Price, B. G. Work, Colonel A. F. Townsend and J. K. Mitchell.

The report which was read by the chairman, Raymond B. Price, treated the subject of preparedness in a broad and comprehensive manner. The meeting directed that it should be printed and distributed, so that all in the rubber industry may gain benefit from it. This report was as follows:

REPORT OF COMMITTEE ON PREPAREDNESS.

When in August, 1914, the great European war broke out all the theories of the altruists were "knocked into a cocked hat," and the world was confronted with a condition. President Wilson has finally come to realize that this condition brought serious

responsibilities to his administration and it brings equally serious responsibilities to every intelligent American. Quoting President Wilson's speech of last Saturday in Cleveland, "Wherever there is contact there is friction," he referred to international contact. In this country we have insufficient contact. America to-day is a mob of individuals filled either with indifference or with pet theories, when the great need of the nation is for self-sacrifice and unity of thought and action. This is no time for half way measures. Either we must follow the lead of China, or we must prepare immediately to face the world with all the thoroughness and all of the organized resources of this country.

Last week I spent an evening with a group of leading naval, military and civil authorities, and the note of the evening seemed to be one of hopelessness—the fear that America could not and would not, because of her very habits of extravagance, indifference and lack of unity, rise in time to meet the present emergency. President Hadley, of Yale, who cannot be accused of being an alarmist, ten years ago prophesied that unless America changed its habits the end of democracy was in sight.

The need in this country is to arouse the public conscience, and for the business and scientific men of the nation to insist upon this country being run along scientific business lines. I shall not bother you with numerous details; but if you will read the pamphlets which have reached you, or which will reach you in a few days, those who have not already posted themselves will learn something of the military inefficiency of this country for the past 140 years. The lawyer and the politician pass the indifference of you and me have permitted the critical condition which exist to-day.

When one pauses to consider that in the face of the dangers visibly confronting us, our army and navy are still administered as separate and frequently antagonistic units, that in the Philippines we are constructing defenses approved by the Naval Board and opposed by army experts as inadequate defense against land attack, and those defenses are costing \$34,000,000; when we learn officially that the two battleships voted by Congress last March are not yet under construction, and that they have been apportioned to navy yards which cannot begin work on them for months to come; that the official estimation that private yards are better equipped to handle government work; when reliable authority states that the private ship yards are in position to lay down 13 capital vessels immediately; when we remember that of the three largest battleships now under construction, the "Idaho," being built by the New York Shipbuilding Co., is 50 per cent. advanced as to hull and 36 per cent. as to machinery, but that the "California," authorized at the same time, and being built in the Brooklyn Navy Yard, is only 13½ per cent. advanced as to hull and 4 per cent. as to machinery; when we listen to the arguments in favor of Government-owned munition and shipbuilding plants because the private yards and manufacturers make excessive profits, and then listen to what our experts say, that in case of need the combined public and private yards and plants will be inadequate to our needs, every thoughtful American must stop to think what this means to him, to his family and to his country.

Japan is building battleships in half the time that we require, and building both merchant and naval vessels to the limit of her financial and building resources. During the past year she added 650 sea-going steamers to her fleet, while we have surrendered our last important fleet on the Pacific Ocean. Again, consider that of the \$850,000,000 spent on waterways by Congress, a half billion dollars has been thoroughly wasted without benefit to the nation, and when we think how we ourselves smile at the mere mention of the pork barrel and tolerate such rottenness, which is flaunted openly in our faces, the American business man has indeed an accumulated responsibility to meet.

Some years ago Senator Aldrich claimed that the Federal Government could save \$300,000,000 per year by applying ordinary business efficiency. About the same time Louis Brandeis claimed that the railroads of the country could save \$1,000,000 per day by adopting demonstrated efficiency methods. Since then, under the pressure of an inefficient government, the railroads have become efficient. It is now time that the efficient railroads should force an inefficient government to become efficient.

The business men and industrial leaders of this country in general, partially for political reasons, are in bad repute. Those of us who believe that American industries are founded essentially upon integrity and service have a right to take such action as will tend toward a just public opinion, without which business men will not be in position to do their full share in leading the nation towards safer conditions. When railroad men were unjustly assailed, they united and fought back, and to-day have won public sympathy.

The automobile industry represents an unprecedented industrial achievement. This has been accomplished by standardization, the result of scientific thoroughness, open-mindedness and willing-

ness to make distinct sacrifice on the part of individuals for the good of all. The industry, as it exists to-day, would have been utterly impossible with the jealousies, lack of cooperation and self-sacrifice common in the rubber industry. One small company in New Jersey at one time had 800 different styles of lock nut washers between the sizes of $\frac{1}{4}$ and $\frac{5}{8}$ inch. By standardization this number was reduced to 20. Many manufacturers were obliged to scrap expensive supplies to achieve this benefit of standardization, the result of which was that all manufacturers were able to obtain standardized supplies in large quantities at low cost, and in minimum time.

Something can be achieved along this line in the rubber industry by co-operation with the Government; but probably the greatest opportunity for the rubber industry is to set an example to other industries of this country, indicating that we, as rubber men and as individuals, realize our responsibilities and are prepared to make sacrifices to live up to them.

Figuring that there are over a quarter of a million people directly engaged in rubber work, and that these workers have an average of only three persons dependent upon them, there are 1,000,000 people directly dependent for their very existence upon uninterrupted supply of crude rubber, most of which comes half way around the world, and practically none of which is produced within our own borders. Even if this country is prepared against invasion, is it prepared to insure that uninterrupted supply of crude rubber, upon which a million lives depend? At least three maritime nations stronger than ourselves could stop that flow, even if we were nominally at peace.

Those who have had the responsibilities of facing embargo conditions a year ago realize better than the rest of us what this means to America. The adequate supply of crude rubber to the United States under the complicated international conditions now existing is by no means assured; and it is up to us of the Rubber Club of America to do our part wisely and well to prevent disaster. This cannot be accomplished by leaving the work to be done by any individual or by a committee. If every man is not willing to contribute his part the men conducting the rubber industry, which is more susceptible to injury than most other American industries, may have to face a terrible responsibility to employees, customers, and stockholders.

Aside from the million directly involved and the other millions indirectly concerned, think of what a calamity it would be if the advantages of the beneficent services of rubber were suddenly eliminated! It has been stated that the country would be paralyzed if the telephone and the telegraph were suddenly destroyed. The day is almost here when the same can be said of rubber, and what depends upon rubber; and this is especially true of the needs of modern warfare.

We may think that the tariff question does not concern us as much as it does other manufacturers. Is it not conceivable, however, that the foreign countries which control the entire rubber supply of the world might easily manipulate their export regulations so that this country should receive little or no crude rubber, or at such prohibitive prices as to spell disaster to the industry?

Our present tariff contains no provision for international bartering or privilege. Our pork barrel, pension expenses and general governmental extravagance are preventing this country from having the visible naval power which chiefly compels concessions in time of extreme need. We have deliberately and voluntarily turned over to foreign nations the carrying of our products and the bringing to us of our raw material.

We have permitted our employees by hundreds of thousands to be misinformed and misled by agitators to their own ultimate danger and have not made the slightest effort to present to them the other side of the question. In a country where millions of people care not what flag they are under, we, the business people, have been strangely indifferent to our responsibilities in the field of patriotism, education, humanity and even common safety.

Much of the agitation for preparedness has been emotional. If the business and scientific men will unite in a thorough, persistent campaign, based upon logical business common sense, no man can foretell the result. What can the business and scientific men do? President Wilson and Secretary Daniels built better than they knew in forming the Naval Consulting Board, which is composed of conscientious scientific men trained to do things, and to do them thoroughly and quickly. They have organized themselves for results regardless of political pressure, and have secured the cooperation of the 38,000 members of the five leading scientific societies of the country.

Their plans are well under way, first, to investigate the manufacturing facilities of this country, and then to organize them. While I am not privileged to disclose their plans in detail, such as have come to me I can vouch for as being feasible and thor-

ough. Many scientific men occupy subordinate positions; so it becomes essential for the greatest speed in obtaining results to have the sympathetic cooperation and support of business men in this mobilization of American industries.

It is believed that a body of representative business men may be created and recognized by Federal executives, who can cooperate with the government experts and scientists of the country, not only to mobilize American industries, but to teach efficiency to the government itself. Each industry must be so organized within its own sphere as to be able to cooperate in this national scheme; and this is one of the opportunities for the committee on preparedness which is today proposed for the Rubber Club of America.

Every individual and every company has a direct and distinct opportunity to assist in this movement. The United States Rubber Co., for instance, has made an initial appropriation of \$1,000 to assist in the education of its employees. As a first move, specially chosen pamphlets are being sent to 4,500 of its most intelligent members, indicating the seriousness of conditions, pointing out some of the weaknesses, and suggesting that each individual should investigate the facts, form his own opinions, write to his congressman and senators, and talk with his friends and customers.

There must gradually be formed an intelligent public opinion crystallized along several specific lines. All of our resources for defense must be coordinated and directed by a national council of defense. Universal military training must be eventually recognized as the only safe and democratic support for our regular army. Every section of the country must be compelled to subordinate local advantage to national safety. General governmental efficiency and economy in administration at the expense of the pork barrel must be quickly achieved.

The budget system for appropriations must be generally applied. The tariff must be scientifically studied, and so applied as to stabilize industry in this country, and protect the interest of Americans both at home and abroad. An adequate merchant marine must be developed in conjunction with naval auxiliary needs along such lines as to standardize and insure the most speedy and economical production and operation.

Cooperation, rather than antagonism, must be fostered between government and private shipyards, factories and other activities. Trade and business associations should be encouraged and officially recognized as important media for coordination, mobilization and efficiency.

Thorough study must be made of the laws and conditions, whether state or federal, which unnecessarily restrict and hamper business activity. Where legislators are antagonistic to national welfare, dispassionate investigation of the causes should be undertaken to the end that the public shall know the facts.

Study should be made of the American cable system to make sure that foreign cable communication shall be as little as possible affected by international quarrels in which we are not directly involved.

An American navy, adequate to protect the 30,000 miles of coast line in this hemisphere, and to sustain the honor and ideals of America at home and abroad, must be built in the shortest possible time. American education and American patriotism must also feel the influence of the present need for unification. Human welfare, the greatest undeveloped asset of mankind, must receive sympathetic and thorough attention.

We have aliens in our factories and stores, and can help to make them safe American citizens or more intelligent residents in our American atmosphere. The people who do not care what flag they are under can be shown that the working people suffer most when the enemy strikes.

Posters containing a concise statement of salient facts, based on well-known advertising principles, are being prepared for distribution in factories, offices, stores, etc. These offer the best means yet suggested for reaching the man who scoffs at literature and will not read a pamphlet. The fact that, of all nations in the world, America has more international policies, which challenge and antagonize the rest of the world, must be brought home to every American, whether from the point of view of taxpayer, voter, or of the one who desires to live in peace.

THE EXECUTIVE COMMITTEE ELECTS OFFICERS.

Immediately after the annual meeting of The Rubber Club of America, Inc., the new board of directors met and elected the following officers for the ensuing year:

President: HARVEY S. FIRESTONE, Akron, Ohio.
First Vice-president: VAN H. CARTMELL, New York City.
Second Vice-president: H. STUART HOTCHKISS, New York City.
Secretary and Treasurer: HARRY S. VORHIS, New York City.

HOW THE RELIEF FUND FOR BELGIAN REFUGEES WAS SPENT.

It will be recalled that the usual annual dinner of the Rubber Club was not held in 1915, the members having decided by a large majority to contribute the money generally spent for this purpose to the American Red Cross, the Belgian Relief Fund and other humane agencies that were relieving suffering caused by the war in Europe. The contributions were prompt and generous.

The money for the relief of Belgian refugees was turned over to Captain Ernest E. Buckleton, president and general manager of the Northwestern Rubber Co., Liverpool, England, who at that time was spending a few weeks in the United States. Captain Buckleton, who was well known among the rubber trade both in England and in this country, in addition to liberal contributions of money donated the use of a house that he owned in Liverpool for the refugees. This house, which was opened on October 17, 1914, gave hospitable accommodations to thirty-one refugees, principally women and children of the better class. The Rubber Club of America, Inc., through its generous contributions, has aided materially in supporting this worthy work.

The home is under the management of a housekeeper, and at present has but fourteen inmates. Sufficient funds are reported in hand to run it until April 1, when it is proposed to close the house and turn the refugees over to the Liverpool committee, together with any remaining funds. It is interesting to note that of the 200,000 Belgian refugees in England over 1,300 were taken care of in Liverpool, whose citizens, like Captain Buckleton, responded freely to the call of humanity.

REUNION OF THE EMBARGO COMMITTEE.

The New York members of the Embargo Committee, consisting of George B. Hodgman, H. Stuart Hotchkiss and William E. Bruyn, held a reunion dinner on Wednesday, February 9, at Sherry's, in New York City, at which Arthur H. Marks, of Akron, Ohio, the other member, was the guest of honor. It will be recalled that this committee was largely responsible for the successful lifting of the rubber embargo in January, 1915.

THE TIRE FACTORY SERVICE BUREAU ORGANIZES.

The Tire Factory Service Bureau, Akron, Ohio, has been organized to assist tire manufacturers by furnishing expert advice and supervision. It supplies a want frequently felt by manufacturers, of a source from which assistance necessary to adjust complications or remedy defects can be secured. The service given by the bureau consists of mold and core designing, purchasing and installing equipment, selecting crude rubber, compounding, tire construction, overcoming manufacturing defects, promoting efficiency, scrap utilization, experimental service, etc.

ANALYSIS OF RUBBER FLOOR COVERINGS.

The amount of rubber used in commercial samples of floor tiling has been made the subject of investigation and report by the International Association for Rubber Cultivation in the Netherlands East Indies.

Slight wear and softness combined with elasticity are considered the chief advantages of rubber tiling over other floor coverings. Grinding tests were made for ascertaining the wearing qualities and the hardness of the samples was determined by the Breuil "elasto-durometer." The percentage of rubber in the samples was determined by deducting the sum of the resin, alcoholic extract and the part insoluble in paraffin from 100.

The author presents a tabulation of his analytic results, including thirty-five samples, seventeen of which are commercial products and the balance samples made in the Government Experimental Station at Delft. The conclusion presented is that minimum percentage of new rubber for a mixture for floor covering should be from twenty to thirty per cent. The recommendation is made that the purchaser make the rubber content a matter of specification to be checked by analysis.

CAUSES OF SPREADER FIRES.

To the Editor of THE INDIA RUBBER WORLD:

I have had the fires on which the curve, published in your issue of February 1, 1916, on Humidity and Rubber Spreaders, looked up and they are as follows:

JANUARY, SIX FIRES.

- January 23, 1893. Cause unknown.
- January 25, 1909. Friction.
- January 10, 1911. Static electricity, from the electro-static capacity of a man's body when handling gasoline.
- January 26, 1912. Static electricity, due to cloth friction on spreaders.
- January 9, 1913. Cause unknown.
- January 31, 1913. Static electricity from a knife in the hand of a workman on a rubber spreader. Static capacity of the man's body probably a factor.

FEBRUARY, SIX FIRES.

- February 3, 1911. Cause unknown.
- February 15, 1911. Cause unknown.
- February 16, 1911. Friction in machinery.
- February 15, 1912. Cause unknown.
- February 17, 1912. Cause unknown.
- February 8, 1913. Static electricity.

MARCH, FOUR FIRES.

- March 24, 1911. Cause static electricity.
- March 2, 1912. Cause static electricity.
- March 5, 1913. Cause unknown.
- March 5, 1913. Cause unknown.

APRIL, THREE FIRES.

- April 7, 1909. Static electricity.
- April 26, 1911. Static electricity.
- April 29, 1912. Static electricity.

MAY, TWO FIRES.

- May 1, 1912. Static electricity.
- May 17, 1912. Static electricity.

JUNE, ONE FIRE.

- June 11, 1907. Cause unknown.

SEPTEMBER, TWO FIRES.

- September 21, 1910. Cause, static electricity.
- September 27, 1912. Cause unknown.

DECEMBER, THREE FIRES.

- December 8, 1907. Cause unknown.
- December 7, 1908. Cause unknown.
- December 8, 1908. Cause unknown.

Yours very truly,

F. J. HOXIE,

Engineer and Special Inspector,

Boston, Mass.

Associated Factory Mutual Fire Insurance Co.

NEW TRADE PUBLICATIONS.

Katzenbach & Bullock Co., Trenton, New Jersey, has issued a convenient pocket catalogue of chemicals and colors. The list includes a line of industrial chemicals, oils, colors, etc., employed in the rubber trade.

An interesting method of tire repairing which really consists of rebuilding the injured part of the casing, is described in the January issue of "The Goodrich," distributed by The B. F. Goodrich Co., Akron, Ohio.

The net price list of Beacon Falls Rubber Footwear, issued under date of January 1, by the Beacon Falls Rubber Shoe Co., Beacon Falls, Connecticut, is a 40-page booklet, illustrating the "Top Notch" footwear.

"Insuring the Coal Supply" is the title of a new pamphlet just issued by the Link-Belt Co., Chicago, Illinois, showing methods of handling coal in large industrial works. "Wagon and Truck Loaders" is another pamphlet sent out by the same concern describing small mechanical loading conveyors.

Development and Changes in the Golf Ball Industry.

AT the present time considerable attention is being attracted to the golf ball industry owing to the fact that the Haskell patent, under which most of the popular golf balls are manufactured, is about to expire in the United States, and also that announcement has been made that The B. F. Goodrich Co., Akron, Ohio, has disposed of its golf ball business to A. J. Reach Co., Philadelphia, Pennsylvania.

When the Haskell patent expires on April 11, it is expected that balls of English manufacture will be imported into the United States in large quantities to compete with American balls now on the market. Announcement has been made that

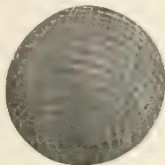
prohibitory duty upon imported golf balls because they were taking too much gold out of the country.

Three or four hundred years ago golf was played with a leather covered feather ball. The leather was of untanned bull's hide, the covering consisting of two round pieces for the ends, and one zone piece for the middle. After being softened, these pieces were shaped and then firmly sewed together, a small hole being left through which the feathers were afterwards inserted.

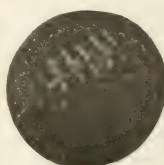
Before stuffing the ball the cover had to be turned inside out through this little hole, thus bringing the seams on the inside—an operation not without difficulties. The making of this feather



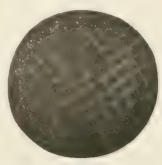
FEATHER BALL.



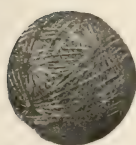
HAND-HAMMERED
GUTTA PERCHA BALL.



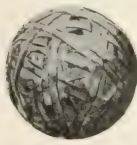
"ECLIPSE" BALL.



"SILVERTOWN" BALL.



WINDING OF
"HASKELL" BALL.



RUBBER RINGS
OF "BOGEY" BALL.



SECTION OF
"PNEUMATIC" BALL.



"DIMPLE" BALL.

the high-grade American balls, such as the "Whippet" and the "Dimple," will be sold at the same price as formerly, \$9 per dozen, and that the "Silver King," a popular English ball, will be offered to the public on April 13 at the same figure. To compete with other English balls that may be imported, it is said that American made balls formerly selling for 65 cents each will be offered this season for 50 cents, that 50 cent balls will sell for 40 cents, while others may be marked as low as 25 cents each.

It will be remembered that in 1905 the English courts decided that the Haskell patent on golf balls did not hold in England because of prior uses of the same principle. Then the English balls began to make their appearance in this country through mail deliveries to individuals, but few sales were actually made by this method, and it was soon discontinued.

THE HISTORY OF THE GOLF BALL.

There is no record as to the age of golf. It is known that it became fairly popular in Great Britain during the fifteenth century. It is also recorded that golf was denounced from the pulpit in Scotland because it was played "in tyme of sermones," leaving only empty benches in the "kirk" and in parliament, because it led to neglect of the art of war so necessary for defense against the English. One of the Scotch kings imposed a

ball was considered one of the most arduous labors of the day, because in the packing, the feathers were inserted through the small opening in the leather cover, and pressed in with an iron rod, one end of which had a small, flat breast-plate, which enabled the maker to use the weight of his body to compress the feathers. This work was so severe that golf ball makers in those days seldom lived past 38 years.

The balls cost about 5 shillings each, and were an expensive item, for money was of more value then than now. Golf was only played by the very rich, as the other classes could not afford to buy the balls, and it was referred to as the "gentlemen's game." The size of the old feather ball was the same as the balls now in use, approximately twenty-seven and one-half sixteenths of an inch in diameter.

In 1848 gutta percha balls were first introduced into Europe, Sir Thomas Moncrieff, an English enthusiast, being generally credited with having conceived the idea of making golf balls of this material, although the Rev. Robert A. Paterson claimed to have rolled gutta percha clippings into a ball, which he painted and used on the links in 1845.

Gutta percha balls soon became popular as their price was about one-fifth of that of the original feather balls, thus bringing golf within the reach of many. The number of devotees

rapidly increased. In making the earlier gutta percha balls, the gutta was boiled until soft and then rolled by hand until smooth and round, but its flight was never true and, strange to relate, the more it was played with and hacked about, the better its flight seemed.

Then some one suggested that the surface of the ball might be nicked into lines with a shoemaker's hammer, and this was done with good results. The flight of the "hand hammered" ball was now all that could be desired, and the feather ball was doomed. The demand for balls grew to such an extent that ball makers, who formerly were situated at the links, selling every ball direct to the players, were forced to produce balls in larger quantities and by a quicker method. By this new procedure, when the gutta was softened, a quantity sufficient to make one ball was kneaded and rolled in the palms of the hands, then put into a steel mold and pressed in a vise until sufficiently cool to be taken from the mold and dropped into cold water to harden.

The problem of marking more quickly than by the hand hacking method was solved by the use of a mold made with the markings cut inside. The ball was dipped into hot water, put into the marking mold and squeezed again in the vise, with the result that the ball was regularly marked all over.

By this time the manufacturers of gutta percha goods, who were chiefly large rubber concerns, began to interest themselves in the golf ball industry, and made the gutta percha into rods of sufficient size to make one dozen balls. The small makers bought these especially, as the gutta was then already cleaned and massed, and only required to be cut and stuffed into the molds, painted and sold.

Freshly made balls, however, were so soft that they soon lost shape, and seasoning was found necessary. The small makers could not afford to put their manufactured balls aside for any length of time, so large manufacturers with plenty of capital took up the making of golf balls.

The India Rubber, Gutta Percha and Telegraph Works Co., Silvertown, London, was among the first to do this. When the products from the large manufacturers were placed on the market, the game which had been held in check for want of supplies began to forge ahead, and even working men took up golf.

In 1884 the "Eclipse" ball, made of a composition of cork, rubber and gutta percha, was introduced, and many thought it would meet the demand. It did not chip or lose shape, but it proved to be too heavy, and would not rise, but rolled along the golf course and into every bunker on the links. The paint did not stick properly, and the ball became black when a few holes had been played. This disgusted the players and the ball died a natural death.

The "A1" ball, made of pure gutta percha, followed the "Eclipse" and for a time was popular. The Silvertown company then brought out the "No. 4" ball, made of black gutta. This displaced the "A1," as it was harder and more serviceable. The first pebbled ball was called the "Ocobo." It had a harder surface than any of its predecessors and soon met with favor. All of these balls of this period sold at one shilling each, which was considered a high price, until the Silvertown company once more came to the front in 1890 with a new ball called the "4 S's," composed of pure gutta percha, which possessed the greatest driving qualities of any ball yet produced. It had a pinkish shade before painting, kept its shape, held its own against competitors, and sold for a guinea (\$5.10) a dozen. This relatively high price did not stop the sale, and the demand was so great that it became difficult to fill orders.

At this time America was being smitten with the golf fever, and the ball question was taken up seriously, and good solid gutta balls were produced by the Boston Belting Co., the Davidson Rubber Co. and others. After experimenting with the comparatively unsatisfactory balls of that time, Bertram G. Work,

of Akron, Ohio, and Coburn Haskell, of Glenville, Ohio, devised a ball which was patented April 11, 1899. Their patent provides for "a golf ball, comprising a core composed wholly or in part of rubber thread wound under high tension, and a gutta percha inclosing-shell for the core, of such thickness as to give it the required rigidity," and also in the second claim, for "a golf ball, comprising a central core section of relatively non-elastic material, rubber thread wound thereon under tension," etc.

The extra distance resulting from this new ball called the "Haskell" won the hearts of all golfers. The only drawback to it was that it did not have a "click" when hit by the club, and to golfers in those days, half the pleasure was that fascinating sound. This difficulty, however, was soon overcome. The "Haskell" ball when first made was produced laboriously by winding rubber threads on the core by hand, and the total output for one man was three balls a day. After experimenting, The B. F. Goodrich Co. devised a machine that in three minutes accomplished the same work that one man formerly produced in a day.

This ball has a core of soft rubber about the size of a small marble around which are wound seven hundred feet of tightly stretched rubber thread, and the whole is covered with gutta percha about one-eighth of an inch thick. All patent infringements were successfully stopped except in England. Licenses for the manufacture were granted by the Haskell Golf Ball Co., of Akron, Ohio, to several manufacturers desiring to make balls under the Haskell patent.

In 1902 the Kempshall Manufacturing Co., Arlington, N. J., took out sixty patents on golf balls, of which the main features were the use of plastic material forced into a hollow sphere of rubber or gutta percha, and also a sphere expanded by liquid gutta percha and covered with celluloid. Later, in 1905, a "Pneumatic" golf ball was introduced by the Goodyear Tire & Rubber Co., Akron, Ohio. This consisted of a core which was a retainer into which air under pressure of eight hundred pounds per square inch was forced. The "Bogey" ball, made by the Seaman Manufacturing Co., Milwaukee, Wisconsin, appeared in the same year, and had a non-elastic center on which were tightly stretched small rubber rings over which was the usual gutta percha cover.

The latter day balls include the "Colonel" of the St. Mungo Manufacturing Co., Glasgow, Scotland, and New York City, and the green, red and black "Circle" balls of Wright & Ditson, Boston, Massachusetts, which appeared in 1911. The next year saw the advent of the "Dimple," made by A. G. Spaulding & Bros. in both this country and Great Britain. Other well-known golf balls are the "Whippet," formerly manufactured by The B. F. Goodrich Co., Akron, Ohio, and now by A. J. Reach Co., Philadelphia, Pennsylvania; the "Diamond" balls of the Worthington Ball Co., and the latest balls, "Bullet Honor," "Witch," "Wizard" and "Orange Domino" of A. G. Spaulding & Bros. The "Whippet," "Stag," "Meteor" and "Scotty" balls, all made under the "Haskell" patent, have been sold by The B. F. Goodrich Co. to the A. J. Reach Co.

A FRENCH TRADE STAMP.

Symbolic stamps or "stickers" are extensively used by European concerns for attaching to correspondence. The stamp here shown is used by the Société des Etablissements Bergougnan, Clermont-Ferrand, Puy-de-Dôme, manufacturers of "Le Gaulois" tires. The golden sun of prosperity, rising over the peak of the Puy-de-Dôme, casts its light upon the effigy of Vercingetorix, the great Gaulois, hero of the struggles of the Gauls against Roman domination and adopted as the symbol of the "Gaulois" tires. The graceful folds of the French tri-color add to the picture and indicate that "Le Gaulois" tires are of French production.



What the Rubber Chemists Are Doing.

VULCANIZATION EXPERIMENTS.

DURING the past year B. J. Eaton and J. Grantham, of the department of agriculture of the Federated Malay States, have continued their experiments in vulcanization on the extent of variability caused by lack of uniformity in factory methods, which are reported in the "Agricultural Bulletin."

EFFECT OF CREPING.

Samples of rubber were prepared, which had been creped as follows: A, 5 times; B, 10 times; C, 15 times; D, 20 times; E, 25 times. These were mixed and cured under uniform conditions, time of cure in all the experiments being the only variable. The resulting physical tests gave no indication of any differences between the rubbers due to the amount of creping they had undergone.

Although the differences in creping in this experiment were insufficient to produce any effect, it was thought a more severe treatment of the rubber would produce deterioration. A sample of crepe treated in the normal matter, and one severely macerated on the creping machine, when compared gave physical test figures which revealed no effect as regards the mechanical results. The effect of very severe maceration was merely to slightly retard the rate of its cure.

It was therefore concluded that the effect of creping on rubber, both as regards optimum mechanical properties and rate of cure, is negligible unless excessive. The slight effect in retarding the rate of cure in excessively worked rubbers is probably due to removal of traces of a catalytic substance or something necessary to its formation; in other words, to over-washing rather than over-working.

EFFECT OF EXCESS OF ACID.

Two samples were prepared from bulked latex to ascertain the effect of adding an excess of acid when coagulating the latex. Sample A was coagulated by 3 ounces of 5 per cent acetic acid per gallon of latex, and Sample B 15 ounces of 5 per cent acetic acid per gallon of latex. The subsequent manipulation was kept as constant as possible.

The results showed that the use of an excess of acetic acid for coagulation of the latex has a well marked effect in retarding the rate of cure. Probably the acid has the effect of reducing the amount of the catalytic substance finally present in the dry rubber. The mechanical properties are not affected.

EFFECT OF SODIUM BISULPHITE.

No effect was produced by sodium bisulphite on crepe rubbers. There is reason to believe that the use of sodium bisulphite in the preparation of sheet rubbers, and other forms in which the bisulphite is not afterwards completely removed, is injurious.

PREPARATION OF THIN CREPE.

Samples were prepared on an estate normally turning out thin, pale crepe, and each represented a stage in the ordinary process adopted by the estate. The samples were:

- A. The coagulated slab allowed to drain.
- B. The coagulum rolled once.
- C. Rough crepe.
- D. Thick crepe.
- E. Thin crepe.

The samples were kept for 20 days, and then A, B and C were made into thin crepe and dried. D and E were dried without subsequent creping. All the samples contained sodium bisulphite. The tests showed time of satisfactory cure by load-stretch curves as follows: A, 1½ hours; B, 2 hours; C, 2½ hours; D, 2¾ hours, and E, 3 hours.

UNIFORMITY.

An experimental study was made to ascertain how far uniformity is possible under ordinary estate conditions. The latex was bulked in a large tank and coagulated by the addition of 3 ounces of 5 per cent acetic acid per gallon of latex. The rubber was creped the same day, an hour or two after coagulation. It was found necessary at this time to add a small quantity of formalin to the latex in order to prevent spotting. The resulting thin crepe was of a golden color, and brought top prices.

The experiments on thin crepe and uniformity of preparation are thus summarized: The effect of each stage in the preparation of a thin crepe is to retard the rate of cure. It has previously been shown that passing a thin crepe a number of times through a creping machine, beyond that necessary first to produce thin crepe, had little or no effect. When the retardation of the rate of vulcanization reaches a limit, as in the preparation of thin crepe machined on the day of coagulation, a very uniform rubber is obtained, although the rate of cure is very slow and the mechanical properties suffer slightly.

PREPARATION OF BLOCK RUBBER.

The process of preparing block rubber is to thick crepe the coagulum on one machine and thin crepe it on another, and then "worm" it by passage through a perforated plate by pressure. The wormed rubber is then placed in hot air driers for 7 to 8 hours at about 130 degs. F. until completely dry. It is then blocked while still warm in a hydraulic press.

Twelve samples were taken representing the stages from coagulum to the final block, mixed, vulcanized and tested in two sets, the samples of corresponding stages in each set varying as regards age and the use of sodium bisulphite.

These experiments indicated a convenient method of producing a rapidly curing rubber with good physical properties, namely, the slab from the coagulum, with or without sodium bisulphite, should be left ten days to "mature" or develop a rapid rate of vulcanization, previous to being converted into block form. The uniformity of the rate of cure thus produced remains to be tested.

MIXING RAW RUBBERS.

The effect of mixing raw rubbers having different rates of cure was demonstrated, and showed a gradation in rate of cure according to the proportion of fast or slow curing rubber in the mixture. These results are of importance as confirming the probable reason for the uniformity of fine hard Pará, namely, that it is due to averaging of latex collected and cured on different days through long intervals.

A method of averaging could be adopted on any estate to obtain similar results, and would be of marked advantage, but the problem of sampling the mixed rubber for testing would probably be complex.

VELOCITY OF SOLUTION OF LIQUIDS IN RUBBER.

From available data relating to the velocity of the absorption of various liquids by rubber, P. Bary concludes that for any given liquid, the weight, p , of the liquid contained in a unit weight of the rubber (*i. e.*, rubber plus absorbed liquid) after absorption has proceeded for t minutes is given by the formula,

$$p = \frac{p_s}{(A + t)}$$

in which p_s is the value of p corresponding with the saturation of the rubber with the liquid, and A is a constant depending upon the nature of the liquid and the conditions of experiment, particularly the thickness of the rubber sheet.

The values for p , for some of the liquids as used in experiments were: carbon disulphide, 0.916; chloroform, 0.940; toluene, 0.870; ether, 0.718; benzol, 0.840; xylene, 0.849; light petroleum spirit, 0.763; oil of turpentine, 0.848; benzyl chloride, 0.841; nitrobenzene, 0.639.

It follows from the formula that the velocity of absorption in any one experiment is proportional to $(p_s - p)^2$.

SOLVENTS OF GUTTA PERCHA

Herman Prinz has found that oil of eucalyptus and oil of cajuput dissolve gutta percha due to the presence of cineole. Oil of cloves and oil of cinnamon do not contain cineole and apparently have no solvent effect on gutta-percha.

CHEMICAL TREATMENT OF RUBBER.

THE UNITED STATES.

ELASTIC PRODUCTS. 1,159,257 and 1,159,258. Georges Nuth.—The process consists of producing from a sulphurized oil factice by the action of a compound (amin) capable of removing loosely combined chlorine, a resulting body more resistant to heat, water and acids than natural gums, and with a greater elasticity than the corresponding chlorinated factice.

ISOPRENE. 1,159,380. A. Heineman. Vapors of turpentine oil are passed over silver heated to about 450 degrees F., giving a yield of isoprene equal to 25 per cent. of the turpentine oil used, together with about an equal amount of other depolymerization products. About 2000 cc. of vapor per hour may be passed through a silver tube of 6 mm. diameter, 4 meters long, wound into a close coil.

PIGMENT. 1,169,253. Henry A. Gardner. Process for making a pigment containing lead and barium carbonates, which consists in forming a basic carbonate of lead and precipitating barium carbonate in intimate association therewith.

RUBBER SUBSTITUTE. 1,171,187. Alfred A. Glidden, assignor to Hood Rubber Co. The process consists of heating vulcanized rubber waste with an unsaturated hydrocarbons of the series to which butadiene is the lowest member, and stearic acid in definite proportion, the operation taking place in sealed vessels at 212 to 248 degrees F. for periods of one to three weeks.

THE UNITED KINGDOM.

WATERPROOF COMPOSITIONS. 24,106 (1914). C. L. E. Melsom-Brixton. A resilient waterproof composition is obtained by steeping gelatin or glue or both in skimmed or separated milk, then mixing with glycerin, applying heat to produce liquefaction, and finally adding potassium bichromate, ground leather, and other ingredients, such as dextrin, paraffin wax, Venice turpentine, linseed oil varnish, glucose, and a preservative with or without coloring matter, the mixture being heated and stirred.

THE DOMINION OF CANADA.

PROOFING FABRIC WITH RUBBER. 165,820. William Muntz. The process consists of impregnating with two solutions, successively introducing with the second solution substances capable of forming harmless compounds in the fabric by neutralizing the sulphurous and sulphuric acid present.

ELASTIC MATERIAL. 166,177. Maurizio Baricelli. A combination of a gelatinous substance, water, glycerine, antimony pentoxide, acetic acid. Before using there is also added formalin and a substance of high thermal conductivity such as powder of aluminum.

OTHER CHEMICAL PATENTS.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

477,586 (February 10, 1915). Process for accelerating the vulcanization of natural or artificial rubber or similar materials. S. J. Peachy.
477,789 (February 24, 1915). A mastic filler for pneumatic tires, and process of manufacture. S. Ephrussi and S. Bernstein.

LABORATORY APPARATUS.

MELTING POINT OF PARAFFIN WAXES.

AN apparatus and method for studying the melting point of paraffin waxes, as proposed by F. H. Small, will be of interest in rubber laboratories.

Commercial paraffin is not a chemical individual but a mixture of related compounds. Its so-called melting point is merely the average of the melting points of the numerous waxes making up the composite whole. Two samples of paraffin wax, designated as of the same melting point, may be of radically different composition. A so-called crude may consist of individual waxes whose melting points cover a wide range of temperatures,

while a refined wax may consist to the extent of over 90 per cent of waxes whose melting points lie within a range of 5 degrees. Naturally these two waxes will not behave in the same way, will not show the same plasticity and physical qualities. It was to secure a more definite idea of the composition of commercial paraffin wax than was afforded by a simple melting point determination that the apparatus here described was constructed.

In the accompanying diagram—

A is a glass tube, the smaller part being of uniform bore and graduated in equal divisions; *B* is a glass plunger the disk of which fits easily the bore part of the enlarged part of *A*. *C* is a brass disk bored to fit the stem of *B* and of the same external diameter as the disk of *B*.

In use *B* is inserted in the upper part of *A*. Enough of the wax is shaved and introduced into *A* so that when melted it will nearly fill the graduated tube of *A*. The brass disk *C* is then slipped on *B* and allowed to press down the shaved wax. The lower end of the graduated tube *A* is closed with a cork reaching just to the zero mark and the apparatus as prepared is inserted in a tall one-liter breaker filled with water to above the level of the wax as shown in *D*.

The water is warmed by a burner below and is stirred at frequent intervals. The warming process is continued until such time as the wax shows signs of softening. The temperature is then raised very gradually, the plunger *B* being moved slightly up and down to facilitate the flow of any melted wax into the graduated tube. When some of the wax melts and runs down, the temperature at which this occurs is recorded. The temperature is then raised a degree at a time and held at each degree for seven minutes, the plunger *B* being moved slightly up and down at intervals, as before, to free the melted wax. At the end of each seven-minute period the temperature and scale reading are recorded. The process is continued until the wax is all melted.

From the scale readings a simple calculation shows the percentage of the wax melted at any given temperature. The temperature at which 50 per cent was melted corresponds to the melting point as usually determined. If the melted wax is allowed to harden in the tube its inspection will usually show whether the wax contains an appreciable amount of oil.

The apparatus and method have been found sufficiently accurate for commercial purposes.

New Machines and Appliances.

ROTARY VACUUM DRYER FOR RUBBER SCRAP.

THE illustration shows a new Stokes rotary vacuum dryer which has recently been installed and is now being operated in the works of a large rubber company. The rubber is claimed to be dried uniformly, economically and quickly.

The apparatus is equipped with an agitator so that any material carried over with the next charge will not become hard by over-drying. This agitator, which requires very little power to operate, discharges practically the entire contents of the

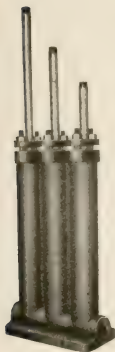


machine and insures uniformly dried material, containing an exact percentage of evenly distributed moisture. The rubber is dried in vacuo at a very low temperature, thus giving a soft and strong product.

It usually takes six men over two hours to spread and take off the rubber when screens are used, but it is said that with this vacuum dryer, three men can do the work in a half hour. The drying is accomplished in from one to six hours, varying with the nature of the scrap. The machine is fifteen feet long by four feet in diameter and has a capacity of from 4,000 to 12,000 pounds in ten hours. [F. J. Stokes Machine Co., Philadelphia, Pennsylvania.]

MULTIPLE EXPANSION JOINTS.

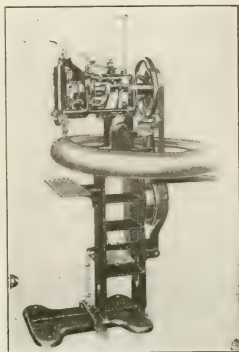
Multiple plate vulcanizing presses that are used in the manufacture of molded rubber goods have from two to seven heating platens. To turn out reliable goods exact temperatures are now required in most rubber manufacturing plants. It is therefore necessary that all plates in vulcanizing presses should be maintained at the same temperature. This is practically impossible, however, where the steam is passing directly through the press, as the drop in temperature is usually about 2 degrees F. from one platen to the other. The multiple expansion joint shown in the accompanying illustration supplies steam to each plate independently, thereby maintaining an even temperature throughout the press. The advantage in thus being able to obtain definite cures will appeal to every manufacturer of molded rubber goods. [Utility Manufacturing Co., Cudahy, Wisconsin.]



SEWING MACHINE FOR RETREADING TIRE CASINGS.

For tire repair shops that make a specialty of repairing tire casings, the machine illustrated herewith should prove useful.

If the re-treaded casing is cemented and vulcanized as well as stitched it is claimed it will give additional mileage equal to or greater than the original tires. Two discarded casings are used, one with a good foundation of fabric and bead and the other with a good rubber exterior to be utilized as the tread. After an inch has been trimmed from its clincher edges, the improved tread is placed outside of the fabric foundation and the two are firmly stitched together by the machine. Being laid in a perfectly normal position and supported by the end of the machine and two projecting rollers, the casing and tread cannot become distorted during the stitching operations.

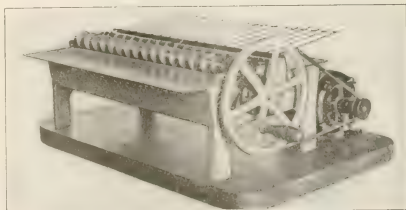


As the casing and tread are moved forward at each stitch, the needle and bobbin threads are passed through a lubricating wax solution to insure a uniform and tight lock stitch.

When repair patches are being sewed on tires, a lever at the top of the machine can be depressed to cause a reversal of the feed. The machine can be driven by either a one-horse power motor or by belting. [Singer Sewing Machine Co., New York City.]

TRABUE'S LABEL GUMMING MACHINE.

A label gumming machine fills a long-felt want among manufacturers who have been gumming or moistening dry gum labels by hand. Little attention has been paid to the up-keep



of the labeling department, but now that labor and materials are high, a machine of this sort should be welcomed by the trade.

These machines can be driven by hand or by small motors. They are made entirely of brass, except the reservoir, and this

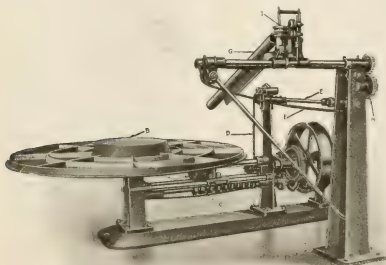
can be easily cleaned by putting into a bucket of water. The label or strip is drawn under the feed roller from the projecting horizontal table and passes out onto the receiving table ready for use.

By filling the reservoir with gum, the machine can be used to gum labels, and by using water, it can be used to moisten dry gummed labels. Where labels are to be put on packages or boxes such as those containing inner tubes and similar articles this gummer should prove a valuable adjunct to the factory equipment. It is made for labels or strips from $\frac{1}{2}$ to 16 $\frac{3}{4}$ inches in width. [W. H. Trabuc, 32 West 83d street, New York City.]

MACHINE FOR PANNING RUBBER COVERED WIRE.

This machine "pans" the wire after the rubber has been applied to it for insulation by the tubing machine, and handles all sizes up to No. 6 B. & S. gage.

Referring to the cut, *A* is the friction drive that revolves the pan *B* in which the rubber covered wire is coiled. The speed of



the pan is increased and decreased by the friction drive *A*, controlled by the screw *C*. Chain *D* is the drive for the knuckle joint shaft *E*, and brass tube *G*, through which the wire runs, is moved back and forth by chain *F*, while sprocket *H* drives the rubber feed rolls *I*.

The rubber covering machine and the above device are driven together so that when the variable speed cones are adjusted for the speed at which the wire is to be delivered, it will be coiled layer for layer in the pan. Then talc or soapstone is sifted over each layer, after which the covered wire is ready for vulcanization.

It is claimed by the inventor that the cost of handling wire may be materially reduced, and that a maximum output of a uniform product may be obtained. [T. J. Seward, Bridgeport, Connecticut.]

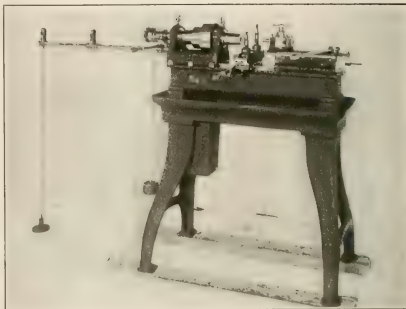
HYDRAULIC VALVE FOR RUBBER MILLS.



This hydraulic valve is constructed to withstand the hard usage of rubber mill work. It is made of a special bronze composition for pressures up to 2,500 pounds per square inch. There are only four parts to the valve; all parts being made extra large, the specially packed stem, large hand wheel or lever furnished makes the valve an easy one to operate. [Utility Manufacturing Co., Cudahy, Wisconsin.]

A GARVIN HARD RUBBER LATHE.

In the manufacture of hard rubber pumps, piping and fittings, the lathe here illustrated is frequently used. It is known as a No. 1 screw cutting lathe and has a plain turret head, automatic collet and a bar feed. Two solid floor legs support the bed of the lathe, which is of box form, and the pan which is fitted with double strainers, and oil or water reservoir. The spindle is hollow and will admit rods up to $\frac{5}{8}$ inch in diameter, with the bar feed attachment, and rods 13/16 inch in diameter, without



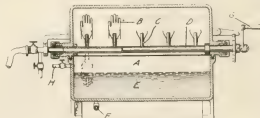
the bar feed. The collet that holds the work is opened and closed by a hand lever. When it is open the feed advances the rod through the spindle and against the stop in the turret head which determines the length of stock to be turned. The cross slide carries a front and back tool post and is operated by a hand lever. The turret head is 4 $\frac{5}{8}$ inches in diameter and has six 11/16 holes for tools, it revolves by hand in either direction and long rods up to $\frac{1}{2}$ inch in diameter can be passed freely through it.

The machine occupies a floor space of 42 x 22 inches and is driven by a three-step cone pulley from a double friction countershaft that is supplied with the lathe. [Garvin Machine Co., New York City.]

MACHINERY PATENTS.

PRICE'S DIPPING AND VULCANIZING APPARATUS.

In this machine, the forms are dipped and then subjected to the action of a partial vacuum to aid in the evaporation of the solvent while at the same time they are heated from the inside to further increase evaporation.



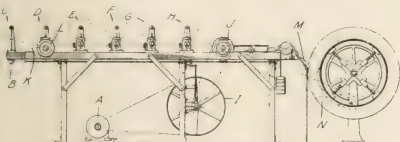
The accompanying cut shows a hermetically sealed chamber *A* in which the forms *B* are mounted on nipples *C*. Steam is admitted to the forms through the hollow support *D* and the rubber solution *E* is forced into the chamber through pipe *F*. The dipping, which is accomplished by turning the handle *G*, is repeated a suitable number of times before the rubber solution is withdrawn into a nearby container. At this stage a vacuum is produced through pipe *H*, the effect of which is to produce a very rapid evaporation of the solvent and drying of the coating on the forms.

By suitable connections and valves, pipe *H* may also be used to cause condensation of the volatile gases so that they may be recovered. A repetition of these operations will give the article on the forms the required thickness, after which heat may be introduced through pipe *H* for vulcanizing. [R. B. Price, assignor to Rubber Regenerating Co., Naugatuck, Connecticut, United States patent No. 1,169,733.]

TIRE FLAP MAKING MACHINE.

A simple and efficient apparatus for the manufacture of tire flaps is shown in the accompanying illustration.

The motor *A* rotates the fabric supply spools *B*, *C*, *D*, *E*, *F*, *G* and *H* by pulley *I*, sprocket *J* and chain drive to each spool. Upon the supply spool *B* is wound a strip of fabric *K* of a width

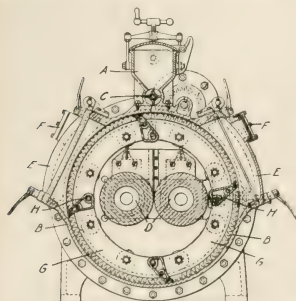


corresponding to the greatest width of the flap to be produced, and upon the supply spools *C*, *D*, *E*, *F* and *G* are wound strips of fabric decreasing in width while spool *H* carries a strip slightly less in width than the bottom layer *K* of the finished flap.

Fabric from roll *B* with the strip from roll *C* are introduced between the first feed roll *L* and its pressure roll, not shown, whereby the two are brought into intimate pressure contact. This process is continued at each spool until the resultant stock passes through tension rolls to guide *M*. As the fabric passes through the guide it is drawn into the cupping drum *N* and because of the concave shape of the bottom of the drum, will assume the desired transverse curvature which is fixed by curing. [W. C. Stevens, assignor to the Firestone Tire & Rubber Co., Akron, Ohio, United States patent No. 1,169,204.]

AUTOMATIC MIXING MILL.

Hoyt's mixer is designed to do away with considerable hand labor and also the necessity of an adjustable apron for collecting and returning to the rolls the ingredients that are not at first caught up by the rubber. The material that



showing the arrangement of the various parts. The powdered compounding ingredients are put into feed hopper *B*, which is mounted on the cylindrical casing forming the main chamber *A*. A bladed shaft *C* then forces the material into the

main chamber at a definite rate. The mixing rolls *D* are hollow and are provided with suitable connections for the inlet and outlet of steam and are revolved at slightly different speeds to give a grinding or kneading action to the material as it passes through. The doors *E*, which are hermetically closed, permit access to the interior of the casing and also permit inspection of the contents by means of the glass windows *F*. The device for conveying the material from the lower to the upper side of the rolls consists of two annular gears *G*, connected by rods to which are attached the paddles *H*. As the gears are rotated in a counter-clockwise direction the material is scooped up from the bottom, carried up on the right side of the chamber and then dropped to the rolls when the paddle has reached a position directly under the feed hopper. [Homer J. Hoyt, assignor to Morgan & Wright, United States patent No. 1,163,089.]

OTHER MACHINERY PATENTS.

THE UNITED STATES.

ISSUED JANUARY 25, 1916.

- 1,169,215. Electric car vulcanizer. E. H. Wiggins, assignor to D. A. Heyman—both of Chicago, Ill.
1,169,576. Portable repair vulcanizer. C. A. Shaler, Waupun, Wis.

ISSUED FEBRUARY 1, 1916.

- 1,170,178. Heel cutting apparatus. W. J. Nesbitt, Los Angeles, Cal.
1,170,383. Spreading machine for coating fabric with rubber or other like plastic materials. A. Wood, Uxbridge, England.
1,170,423. Collapsible core. W. R. Denman, assignor to Miller Rubber Co.—both of Akron, Ohio.
1,170,424. Collapsible core. W. R. Denman, assignor to Miller Rubber Co.—both of Akron, Ohio.

ISSUED FEBRUARY 8, 1916.

- 1,170,520. Cementing machine. F. E. Beverly, and J. W. Cosgrove, Medford, Mass., assignor to United Shoe Machinery Co., Paterson, N. J.
1,170,600. Apparatus for the vulcanization of pneumatic tires with non-skid leather treads. M. Bergougnan, Paris, assignor to Société Générale des Etablissements Bergougnan, Clermont-Ferrand both in France.
1,170,612. Solid tire remover and replacer. H. A. Cavery, assignor of one-half to F. C. Eberly—both of Akron, Ohio.
1,171,038. Repair vulcanizer. T. D. Gard, Kokomo, Ind.
1,171,143. Rotary drier. W. B. Ruggles, Bayonne, N. J.

THE DOMINION OF CANADA.

ISSUED NOVEMBER 30, 1915.

- 165,949. Fluid pressure mold with sheet of rubber. E. Lanhoff, Poissy, Seine et Oise, France.
166,106. Slitting and rewinding machine. The Cameron Machine Co., assignee of J. A. Cameron and G. B. Birch—all of Brooklyn, N. Y.
166,266. Tire vulcanizer press. Goodyear Tire & Rubber Co., assignee of E. Nall—both of Akron, Ohio.
166,396. Mixer mechanism. P. E. Welton, Cuyahoga Falls, Ohio.

THE UNITED KINGDOM.

ISSUED JANUARY 12, 1916.

- 19,878 (1914). Insulated wire impregnating machine. W. Tegg, 7 Woodbine street, Moss Side, Manchester, and London Electric Wire Co., and Smiths Limited—both of 7 Playhouse Yard, Golden Lane, London.

ISSUED JANUARY 19, 1916.

- 20,378 (1914). Method of attaching covers to tennis or like rubber balls. E. C. Wisden-Luff, and Wisden Co.—both of 23 Cranbourn street, London.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

- 477,474 (June 17, 1914). Hydraulic press for vulcanizing pneumatic tire casings. A. Wolber.
477,609 (February 13, 1915). Vulcanizer for repairing tires and other rubber goods. W. H. Molas.
477,719 (February 19, 1915). Improvements in processes and apparatus for rubberizing fabrics. F. A. Seiberling.

NEW MANUFACTURING PROCESS.

THE UNITED STATES.

ISSUED FEBRUARY 1, 1916.

- 1,170,154. Process of making tire casings. H. Hennig, Akron, assignor of one-half to A. Hauschild, East Palestine—both in Ohio.

THE HUNTER DRY KILN—A COMPARISON.

A ROOM for drying is a very important adjunct in the manufacture of rubber goods that in these days of competition and close prices are generally sold under a guarantee. It is well known that the materials, which make up the compounded rubber, must be intelligently prepared in order to produce reliable goods.

Many of the modern drying systems are highly inefficient and unsatisfactory because of the time and space required or the inferior quality of the stock after being dried. That the old drying principles are wrong is claimed by the Hunter Dry Kiln Co., Indianapolis, Indiana, in the following description and comparative tests of the Hunter process and dry kiln:

The kiln is constructed to bring about a rapid circulation of conditioned air by purely natural means, thus eliminating the possibility of mechanical disorder and lack of uniformity of conditions in the drying room. These conditions are automatically controlled, thereby making every day a perfect drying day regardless of atmospheric irregularities.

An ordinary dry room, perhaps, 85 feet long and 17 feet wide, with forced air circulating and condensing system, has a capacity of 14,000 pounds of dry rubber each 7 to 14 days, according to the moisture content of the crude material.

THE HUNTER DRY KILN.

A Hunter dry kiln is 18 feet wide and 35 feet long, inside measurement, and has a capacity of 15,120 pounds of rubber each twenty-four hours. This time allows from 6 to 9 hours for emptying and re-filling the room, the actual drying time being from 15 to 18 hours.

In order to arrive at a figure whereby the efficiency of the two systems may be compared, space, quantity and time must be taken into consideration. The ratio of efficiency will be inversely proportional to the product of the figures representing space, quantity and time of each system. Substituting the minimum time (7 days) of the dry room, and the maximum time (24 hours) of the dry kiln, the efficiency factor is:

Dry Kiln 157

Dry Room 1

Disregarding space and simply considering the possible capacity of each system under existing conditions, the output of the kiln is 7.5 times that of the dry room.

COMPARATIVE RUBBER DRYING TESTS.

The following comparative tests on washed and compounded stocks show interesting differences in favor of the dry kiln:

A batch of rubber was washed, careful attention being given to insure uniformity of mixing on the mills. Of the resultant crêpe sheet, one-half was dried in the regular dry room, and the other half was placed in the Hunter dry kiln. After drying, test batches were mixed from each of the samples, checks being kept on each one. The following data were the results obtained:

PREPARATION OF SAMPLES.

Dry Kiln	15 hours	Moisture	0.79 per cent.
Dry Room	184 hours	Moisture	0.28 per cent.

GREEN TESTS.

	Break. Pounds.	Stretch. Inches.	Efficiency.	Cure at 40 Pounds. Hours.
Dry Kiln	1,235	6.56	5,692	2½
Dry Room	1,275	6.11	7,802	2½
Dry Kiln	1,267	6.54	10,246.73	2½
Dry Room	1,176	6.43	9,805.75	2½

AGED TESTS.

Samples of above cures were aged in circulating dry heated air for three hours at 235 degs F.

	Break. Pounds.	Stretch. Inches.	Efficiency.	Cure at 40 Pounds. Hours.
Dry Kiln	762	5.75	4,381.5	2½
Dry Room	825	4.75	2,493.75	2½
Dry Kiln	1,075	5.91	6,245.75	2½
Dry Room	637.5	5.12	3,264	2½

	Moisture. Per Cent.	Sulphur Mix. Efficiency.	Oil Mix. Efficiency.
Dry Kiln	0.21	1,510	1,720
Dry Room	0.59	1,350	1,375
Dry Kiln	0.30	1,675	1,800
Dry Room	0.43	1,410	1,290

DRYING PONTIANAC.

When Pontianac is washed and milled in one-fourth inch sheets, it presents a dense, dough-like mass. After hanging these sheets in the dry room at 96 degrees F. for ten days, the stock presents a hard, brittle external crust of a creamy white color, and is apparently dry, but contains from 2½ to 4½ per cent moisture by test. The material is shown to contain 1.44 per cent of moisture after twenty-one days under the above conditions, and becomes so crumbly that it is difficult to handle. However, when placed in the dry kiln, Pontianac is dried from 0.75 per cent to 1 per cent moisture in 38 hours, and from 0.3 per cent to 0.5 per cent in 48 hours. This material is then a brown colored, flexible mass, which is slightly tacky, is easy to handle and not injurious to the stock in which it is used.

DRYING COMPOUNDING INGREDIENTS.

Zinc, lithopone, whiting and barytes are dried in from 24 to 90 hours by placing the barrels in the kiln in an upright position and permitting a circulation of air on all sides. These compounds, especially zinc, and lithopone, after being thus dried, do not form in sticky lumps which are hard to pulverize, but powder very readily through the sieve, and seldom cake on the mixing rolls.

DRYING CEMENTED SURFACES.

Two to three hours, depending largely upon weather conditions, are required to dry the cement on inner tube splices and valve bases. In the dry kiln this operation is accomplished perfectly in 25 minutes. Life is apparently given to the cement by this process, and tight, firm splices are the result.

In the construction of double operation motorcycle casings, it has been the custom to paint a heavy coating of cement on a carcass, and a period of from three to five hours was required before the cement was sufficiently dry to permit of the application of the tread. By the Hunter process, however, the carcass is ready for the application of the tread after one hour in the dry kiln, and this period can be shortened if necessary.

All of the above data was taken under actual working conditions.

THE AMSTERDAM CRUDE RUBBER MARKET IN 1914.

Official industrial and commercial reports of the Netherlands for 1914 have recently been published. They contain interesting facts relating to the effect of the war on the Amsterdam crude rubber market during the first five months of the war.

The year 1914 opened very favorably for the Amsterdam rubber market; business was active and the number of buyers increasing. War came early in August and, from then on, very little crude rubber was received. That which arrived was sold without the usual sorting, sampling and careful examination, thereby preventing the levying of the usual taxes, as it was impossible to determine values regarding which no indications were available.

Prices increased with a bound. *Hevea* rubber was especially sought for and brought prices as high as 7 florins per half kilogram [\$2.55 per pound], which was about equal to the highest prices paid in 1910, during the rubber boom.

Shipments which arrived after the stocks included in the auction of July 29, amounted to 499,956 kilograms [1,099,903 pounds], of which 418,924 kilograms [921,633 pounds] were *Hevea*; 61,543 kilograms [135,395 pounds], plantation *Ficus*; 8,255 kilograms [18,161 pounds], *Castilloa*; 1,384 kilograms [3,045 pounds], *Manihot* and 9,850 kilograms [21,670 pounds] of various kinds of forest rubber.

The Editor's Book Table.

TECHNOLOGIE DER KAUTSCHUKWAREN. BY DR. KURT GOTTLOB. Frederick Vieweg & Sohn, Braunschweig, Germany. 1915. [Large 8vo, 256 pages, 92 illustrations.] Published in German.

THIS work is the tenth volume in a series known as "New Handbooks of Chemical Technology" under the editorship of Dr. C. Engler, of Karlsruhe.

The author in his preface states that his object is to supply the technical man with knowledge of the scientific aspects of the rubber industry and the fundamental principles of rubber manufacture, as applied in typical classes of goods. He has also endeavored to aid practical rubber men to correlate their personal experience and observation by a comprehensive treatment of the industry.

No attempt is made to explain the details of manufacture, nor is the question of manufacturing costs treated. The aid of able specialists has been enlisted in the preparation of certain chapters, and thus the value of the discussion of various important topics is enhanced.

The book follows a natural order of arrangement, beginning with historical matter and the chemistry of pure rubber. The work is divided into two parts, general technology and special technology of rubber goods.

In the first section the origin, gathering, washing and drying of crude rubber are treated, together with a chapter on resins and albumens. Tests of crude rubber are given, and the subjects of mastication, fillers, mixing and calendering are considered. Under chemistry and methods of vulcanization is a resumé of the work of the leading chemical investigators of this phase of rubber manufacturing. The technical operations of vulcanization, hot and cold, methods of analysis, tests and apparatus for chemical and physical examination of vulcanized rubber are also given careful attention. The chapters devoted to the tests for crude rubber, and on analysis and testing, are written by Dr. E. Kinscher.

In the second section of the book, which is devoted to the special technology of rubber manufacturing, two chapters are devoted to cold cured goods and seven to hot cured. Under cold cured goods, the chapter on cut sheet is written by E. Herbst, of Vienna, and includes governmental regulations on the plan and equipment of cold cure plants. The author of the volume wrote the chapter that follows on seamless rubber goods, which treats of solvents, dipping, etc.

Under hot cured goods the subject of mechanicals is treated by Mr. Herbst and the author, who review the applications of rubber and discuss the proper arrangement of rubber factory workrooms. K. Misch, of Petrograd, contributes a chapter on rubber heels and rubberized fabric in which the various processes of manufacture are described. Rubber toys are discussed by Dr. Dorogi, of Budapest, who tells of the principles of manufacturing and finishing these products. Two chapters by Mr. Herbst are devoted to all types of solid and pneumatic tires and anti-skid devices, and to the manufacture of rubber footwear. The final chapter is on hard rubber, and is prepared by Engineer Ballog and the author.

TRANSACTIONS OF THE RUBBER GROWERS' ASSOCIATION, 1915, London, England. The Rubber Growers' Association. [Paper 41 pages.]

This is the seventh report of the Council. It comprises lists of the officers, committees, the members and the representatives of the Association on committees of the Rubber Trade Association of London; also officers and committees of the International Association for Rubber Cultivation in the Netherland Indies. The membership of the Rubber Growers' Association has rapidly increased since organization in 1908; it now includes 412 company and 250 individual members. During the past year (1915)

the activities of the Association have expanded with the importance of the rubber growing industry and in consequence reorganization of the Association has been necessitated.

The administration of the Malay and Ceylon Research Funds has been assumed. The work of these funds has greatly benefited the plantation rubber industry by chemical and botanical research. The work of each of the association committees is detailed in the body of the report. Record is made of many gifts made through the Association to the British War Department, of much equipment such as an ambulance, 4000 life saving collars for the Australian navy, rubber boots to the Royal Flying Corps, cushions and pads and rubber flooring to various hospitals.

AGRICULTURAL BULLETIN OF THE FEDERATED MALAY STATES. Department of Agriculture. F. M. S. Kuala Lumpur. 1915. [Monthly parts 50 cents each. Annual subscription \$5.00.]

This publication is the organ of the above mentioned department and of the Planters' Association of Malaya. In it is published a wide variety of scientific and statistical reports relating to tropical agricultural interests, notably rubber and other important plantation products. The papers record the laboratory and field investigations of the large scientific staff of the Federated Malay States department of agriculture.

Notable among the published papers of the past year is the series by B. J. Eaton and J. Grantham entitled "Vulcanization Experiments on Plantation Rubber," an important study of the influences affecting the standardization of plantation *Hevea* as regards curing quality and physical characteristics after vulcanization.

STURB'S BUYERS' DIRECTORY FOR THE WHOLESALE DRUG, Chemical and Allied Trades, 1916. Alfred Sturbs, 30 Cliff street, New York City. 1916. [8vo, 350 pages. Price, \$3.00.]

The revised and enlarged edition of this trade directory is a valuable reference book for the purchaser of drugs and chemicals. It comprises two sections, both arranged alphabetically by materials. The first section contains a list of manufacturers and first-hand dealers in drugs, chemicals, essential oils, laboratory machinery, etc.; and the second a similar list relating to druggists' sundries, glassware, etc.

Many of the articles listed are of interest to the rubber chemist and compounder who will find the directory of practical value in locating sources of supply.

DICTIONARY OF TEXTILES. BY LOUIS HARMUTH. FAIRCHILD Publishing Co., New York City, 1915. [Cloth, 8vo, 174 pages. Price, \$5.]

This dictionary, the result of over seven years of collecting and compiling, contains the definitions of over 6,000 terms relating to textile fibers and fabrics. These are arranged in alphabetical order, each term being discussed independently. While essentially designed for those engaged in the textile industry, rubber manufacturers will find it a helpful reference.

PREDICTS 200,000 TONS OF HEVEA RUBBER IN 1919.

Based the average production of *Hevea* rubber in 400 pounds per acre, it was estimated at a meeting of rubber planters held in Bandung, Java, that the world's production of *Hevea* rubber in 1919 would amount to 200,000 tons.

A RUBBER BRAKE FOR ROLLER SKATES.

One of the latest safety devices in which rubber is employed is a guard for roller skates, to prevent the skater from tipping backward. This is in the form of a steel, rubber-tipped apron, which extends from the top of the heel or counter of the skate to within a very short distance of the floor. Should the skate suddenly attempt to fly out in front of the wearer, the rubber tip comes in contact with the floor and prevents a bad fall.

New Goods and Specialties.

THERMO STEAMING BAG.

MOIST hot compresses are of great benefit in many cases of sore muscles, stiff joints, for reducing purposes, complexion improvement, etc. The old method of application by means of towels dipped in hot water is troublesome, and only partially effective. The towels need constant replacing, as they do not properly retain the heat.



The novel device shown in the accompanying illustration combines a hot water bag and steam compress, a soft cloth pad being fitted in a pocket made in the bag. In this manner moist heat may be retained for a considerable period, avoiding all the annoyance of the old method and giving better results. These steaming bags are supplied in five sizes, from $4\frac{1}{2} \times 6\frac{1}{2}$ inches, designed to apply to a small space, for tooth, car or headache, to 5×17 inches, suitable for tying around the face, neck, or even the arm or leg, if required. [Dr. Jeanne Walter, New York City.]

DROP BOTTLE WITH RUBBER CAP AND BULB.

In using the ordinary dropper and medicine bottle it is difficult to keep the dropper in a sanitary condition. When left outside the bottle it should be washed off each time, before and after using, and placed in a tumbler or other receptacle; and even when the bottle is adapted for holding the dropper in place of a cork, it is by no means as convenient a method as the device here illustrated affords. The bottle and dropper are combined in the form of a glass receptacle with a spout and rubber bulb top, and by this means medicine and liquids of all kinds may be dispensed with perfect cleanliness and ease. A small rubber cap is also provided for closing the dropping end when not in use. [J. Austin Dunn Specialty Co., Chicago, Illinois.]



THE GOODRICH SAFETY RESPIRATOR.

In mines, vaults and places where the air is foul or dust-laden, the health of workmen is menaced to a dangerous degree. But

the modern employer is alive to the fact that safeguards for the health of employees are an economic necessity, and the respirator here illustrated is of interest as an effective means of eliminating danger in many occupations where the kind of protection it affords is necessary.

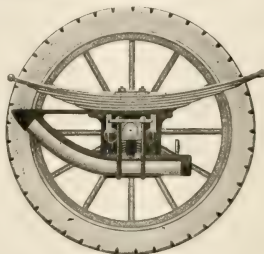
This appliance consists of a well-molded, perforated outer casing of rubber, provided with adjustable straps, which allow for comfortable fitting over the mouth and nose. The interior contains a sponge, which may



be used dry or saturated with water or any medicated preparation as required. [The B. F. Goodrich Co., Akron, Ohio.]

THE JONES PNEUMATIC TIRE SPRING.

The Jones pneumatic tire spring utilizes the principle of a pneumatic cushion used in conjunction with the spring of an automobile. It consists of a shoe and inner tube made in the

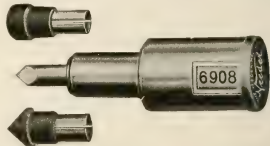


same manner as the usual pneumatic tire and is installed so as to act between the axle and springs of a car as shown in the accompanying illustration to reduce vibration and shock. Adjustments to various weights are made by inflating or deflating.

This device is claimed to make riding easy and pleasant and to permit the substitution of solid tires on the wheels, thus eliminating the troubles common to pneumatic tires. [The Jones Pneumatic Tire Spring Co., New York City.]

THE VEEDER CLUTCH SPEED COUNTER.

The illustration shows the Veeder clutch speed counter, a convenient instrument for determining revolutions per minute made by a shaft or other revolving part. One of the rubber cushion caps is placed on the spindle of the counter, and the counter is pressed against the end of a shaft, causing the spindle to revolve and the counting device to register. Speeds as high as 5,000 r.p.m. can be safely measured. Two rubber tips, one pointed and the other flat, are furnished with each instrument. [Veeder Manufacturing Co., Hartford, Connecticut.]



THE "DU-TELL" PUNCTURE FINDER.

It is sometimes not easy to locate the small puncture in a tube which a nail or sharp stone can inflict. A common method is to partially submerge the tube in water so as to discover the leak from the resulting air bubbles. But this method entails considerable trouble and delay.



The "Du-Tell" device here illustrated is designed to locate these elusive leaks with the least possible trouble. It consists of a nickel plated frame or box, curved to conform to the tread of the tire. On the underside is a fine mesh screen, and on top a transparent protecting celluloid window. On the screen are small fingers made of very thin cork shavings.

The puncture is located by placing the finder tightly against the tire and sliding it around, meanwhile observing the pieces of cork, which will fly up against the celluloid when the leak is reached. [J. W. Anderson, New York City.]

A DAINTY RAINCOAT.

Owing to the scarcity of dyes, rubber manufacturers are favoring styles that do not require the colors that are costly and hard to procure. The result has been some pleasing novelties.



Photo Underwood & Underwood.

The raincoat shown in the illustration is notable as a triumph of the rubber worker's art in proofing. Hitherto such garments have been unattractive, as regards color. Here, however, a remarkably pleasing color effect has been secured which rivals the colored raincoats known as slickers. The material employed in the illustration shown is Japanese mummy silk proofed on the outer surface with white rubber. The garments are made in a variety of pale colors such as white, green, rose and blue. It is possible that the new garment will rival in popularity among collegians the oiled silk raincoats introduced last season. This coat will certainly be appreciated as much for its dainty appearance and light weight as for its utility and will entirely remove the dislike that many women entertain for raincoats. [Harris Raincoat House, New York City.]

"ON THE LEVEL" RUBBER HEEL.

Rubber heels usually wear down on one side, causing discomfort in walking and having to be renewed while there is still a portion of the surface comparatively unworn. The new type of revolving heel here shown does away with this disadvantage by an ingenious device.



The revolving portion, in circular form, is sunk in a flat rubber casing, which forms a frame at the forward end. The heel is attached to the shoe with cement and three nails, one in the center of the circular piece, which turns on a grommet with the pressure of the shoe on the ground. In this way the surface of the heel remains level, wearing evenly, and consequently outlasting the ordinary heel. [E. S. Helwitz, New York City.]

THE 1916 "GOODRICH CHAMPIONSHIP" TENNIS BALL.

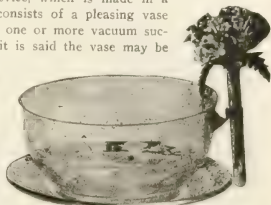
The Goodrich tennis balls have long been esteemed by tennis players, who appreciate the heavy, close-woven, high grade felt surface for the racket to bite into. The cover is sewed by a hand under-stitch, the gilling is strong, and the stitches are close. Every ball is guaranteed a rebound of 50 to 60 per cent on a 100-inch drop. The output is gaged to the actual demand so that fresh, live balls are always supplied. [The B. F. Goodrich Co., Akron, Ohio.]



THE "VACU-VAS" FOR FLOWERS.

In these days, when floral decorations are playing an important part in many homes the "Vacu-Vas" should be especially appreciated. This device, which is made in a variety of designs, consists of a pleasing vase to which is attached one or more vacuum suction cups by which it is said the vase may be securely attached to a mirror or to varnished woodwork.

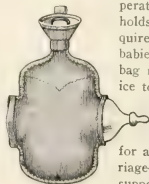
Flowers displayed in this manner may be placed in such position as to obtain the best decorative effect. The "Vacu-Vas" may be placed against the glass of an automobile without fear that the jolting of the car will lessen its adherence. [Daniel Low & Co., Salem, Massachusetts.]



THE RUBIN DUPLEX WATER BOTTLE.

The accompanying illustration shows a water bag so constructed that an infant's nursing bottle can be placed within a central opening and its contents thus kept at the desired temperature. If filled with hot water the bag holds the bottle in a warm pocket until required, while during the hot season, when babies are taken to the park or visiting, the bag may be filled with ice water or chopped ice to prevent souring the milk.

The advantages of this device are many. The weight of the nursing bottle fixed in this manner is too great for a baby to throw it out of the crib or carriage—a common habit—and the bag forms a support for the bottle, which prevents it from rolling under the baby's head or body. If a ribbon or bandage is passed through the opening, the water bag may be attached in a stationary position to any part of the body. [The Vulcalose Co., Chicago, Illinois.]



WATCH HOLDER FOR STEERING WHEEL.

The automobilist is usually running against time and the old dashboard clock has frequently proven unsatisfactory. The device shown is a jet-finished holder and rubber cushion for a watch. This is attached directly on the steering wheel, the rubber cushion preventing vibration. These holders are made to fit any watch and any steering wheel. [Motor Car Specialties Co., Boston, Massachusetts.]



"BUDDY" INSIDE LACE PACS.

The "Buddy" inside lace pacs are new half boots of rubber that lace on the inside, thus preventing the laces from cutting the shoes and making them leak, as is customary with those that lace in front. It is claimed that these pacs are made of pure rubber in a way that tends to resist wear. Wearers appreciate the ease with which they are laced, which is conveniently done by placing the foot across the knee. [Beacon Falls Rubber Shoe Co., Beacon Falls, Connecticut.]



RUBBER-COATED PATIENTS' BIB AND LABORATORY APRON.

The first illustration shows a bib that is specially designed for convenience, complete protection, and quickness of adjustment in the sick-room, and it is also very practical for dental use.

There are no strings, clamps or buttons to get out of order—simply a spring which adjusts itself and saves the necessity of tucking a towel around the neck.

These bibs are 28 inches wide and 36 inches long, and are made of high-

grade white cloth, heavily coated with rubber. They can be had in white, black, or maroon.

In the convenient and thoroughly practical laboratory apron, also shown, two self-adjusting spring attachments (marked *A* and *B*) serve the same purpose as the one in the bib and do away with annoying and time-consuming fastenings. It is made of heavy, rubber-coated sheeting, universal size, and of the same colors as the bib. [Frank Betz, Hammond, Indiana.]

Within the last few years outing shoes have undergone a remarkable transformation. With the spread of interest in athletic sports, especially among women, comfort, combined with good looks and variety in style, have been added to the old requirement of mere utility.



A recent development is the outing pump of silk, with white rubber sole and heel and neatly tailored bow or plain colonial buckle. The pump here shown is of black silk, but they are also supplied in white, blue and other pleasing and fashionable colors. [Converse Rubber Co., Malden, Massachusetts.]

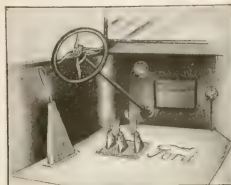
THE "BI-PLANE" SIDEWALK COASTER.

Sidewalk coasters are a source of never-ending amusement for children, and their use does not overtax the muscles, as in the case of many childish sports. The rider stands on the platform between the wheels and pulls the handle back and forth, slight effort being required to run the coaster. The new model here shown, called the "Bi-Plane," has 10-inch, full ball-bearing, rubber-tired wheels, with spokes set into the rims with nipple bolts. Finished in maroon enamel, striped in silver, it forms a durable and highly attractive plaything. [F. A. O. Schwarz, New York City.]



FORD AIR BREAK.

In a Ford car the openings at the clutch and brake are very large. This, as well as the fact that there is no pan under the car, permits the air to come through at these points in such volume as to render the driver's position one of considerable discomfort, at any season of the year.



A contrivance to overcome this unpleasant feature is shown in the "Ford Air Break" here illustrated. The openings are encased in a covering of specially prepared double texture material which is very strong and heavy and which effectually prevents the entrance of air. [Franklin Rubber Co., Boston, Massachusetts.]

RUBBER TATTLING SHUTTLE AND THIMBLE.

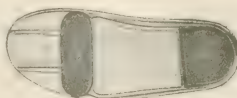
Tatting, which is the name for attractive, lace-like designs worked in fine thread and used as edgings and trimmings, is coming again into popularity after years of comparative neglect. This work demands a special shuttle, and the first illustration shows a new tattling shuttle of highly polished black hard rubber.

Lightness is an important feature in the hard rubber thimble, also shown. It is claimed for this thimble that it will not tire the finger of the user. It is inexpensive and durable, and is supplied in all the standard sizes. [American Hard Rubber Co., New York City.]



WORK SHOE WITH RUBBER HEEL AND ROCKER BAR.

Improvements are constantly being made to meet the demand for shoes that will be waterproof, possess unusual durability, and yet not burden the feet of the wearer unnecessarily with their weight and clumsiness. A recent candidate for favor utilizes aluminum for the lower portion of the shoe, thus providing a strong waterproof shoe of the minimum weight, while the solid rubber heel and rocker bar, here shown, are to provide comfort, both in standing and walking. [Racine Aluminum Shoe Co., Racine, Wisconsin.]



RUBBER SEWING FINGER.

In sewing, especially when working with heavy, unwieldy materials, it is not only the thimble finger that suffers if unprotected. The forefinger is apt to be pricked and becomes callous and sore. A convenient protection is shown in the rubber sewing finger here illustrated. Ventilation at the small end avoids sweating or drawing, while the inside ribbing holds it securely on the finger. When counting bills or handling papers of any sort, the operation will be greatly facilitated by the use of these rubber fingers with the ribbed side turned outward. They are made in three sizes, small, medium and large. [C. J. Bailey & Co., Boston, Massachusetts.]



The Obituary Record.

CHARLES H. ARNOLD.

CHARLES HENRY ARNOLD, for years a leading figure in the crude rubber business, died at the Hotel Manhattan, New York City, February 20. He had been an invalid for over a year, having never fully rallied from a severe attack of pneumonia. Some three weeks ago he left his home in Stoneham, Massachusetts, and came to New York to arrange certain business affairs prior to a visit to Augusta, Georgia. The effort was too much for him in his enfeebled condition, and the end

came from physical exhaustion.

Mr. Arnold was born in Roxbury, now a part of Boston, November 14, 1860. He attended the Boston public schools, and when 14 years of age entered the employ of Henry A. Gould, who was then a Boston commission merchant. Soon after Mr. Gould began to import gutta percha, and later india rubber. Both of these commodities were sold to rubber manufacturers by the enterprising young clerk.



CHARLES H. ARNOLD.

During his visits to the rubber factories he met Colonel N. Chapman Mitchell, who was just beginning the reclaiming business that later became the great Philadelphia Rubber Works Co. With Mr. Gould's consent, Mr. Arnold began on his own account to purchase "gossamer" rubber scrap from the Conants, Klous, Columbia, Mystic and other New England factories, having it reclaimed and reselling the product.

This became so profitable that at the age of 21 he embarked in business for himself under the firm name of C. H. Arnold & Co., with Frank H. Atwood as partner, selling gutta percha and reclaimed rubber. This business prospered, but in 1894 he liquidated it and became Boston representative of the firm of Reimers & Meyer, later Reimers & Co. On the retirement of Hermann Reimers in 1903 the firm of Poel & Arnold was formed, representing Heilburt, Symons & Co., of London, the headquarters being in New York City. In 1911 Mr. Poel retired, and the firm name was changed to Arnold & Zeiss, which it has since remained.

Mr. Arnold was widely known and universally respected by the rubber trade at home and abroad. A man of marked individuality he impressed all with his sturdy common sense, rigid uprightness and uncompromising fairness. Serious and often reserved, he nevertheless made firm friends, and where he gave his own friendship it was loyal, frank and enduring.

Of the five sons who survive him two are connected with the rubber trade: W. H. Arnold, who is the Boston representative of Arnold & Zeiss, and H. C. Arnold, who is the assistant superintendent to the Converse Rubber Shoe Co.

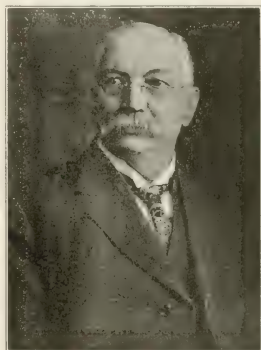
In accordance with Mr. Arnold's last wishes the funeral services held at his home in Stoneham, Massachusetts, were of the

simplest character. Many prominent men in the rubber trade were present, including members of the Rubber Club, Mr. Arnold having been one of the founders of the New England Rubber Club, a charter member of the Rubber Club of America, and a director in both organizations.

JAMES H. McKECHNIE.

James H. McKechnie, president of the Canadian Consolidated Rubber Co., Limited, Montreal, Canada, died at his residence in that city on February 8 after an illness of ten days.

Mr. McKechnie was born in Granby, Quebec, in 1849. He received a public school education and early in life was engaged in a general store business. While interested in a saw mill near Granby he went to Montreal to arrange for a purchase of rubber belting. Visiting the Goodyear store, he noticed a large quantity of gossamer coats that had been made in the States. He obtained his belting and also a suggestion that resulted in the large business he later developed.



JAMES H. McKECHNIE.

When he returned to Granby he started a factory for making gossamer coats. That was in 1877. In 1883, in company with the late S. H. C. Miner and others, he organized and became general manager of the Granby Rubber Co., Limited. This corporation, as every one knows, was very successful and had built up a large and profitable trade when it was merged with the Canadian Consolidated Rubber Co., Limited, and Mr. McKechnie became a vice-president. In April of last year he was made president of the company and since that time he was elected president of the Canadian Consolidated Felt Co., Limited.

For nearly two score years, Mr. McKechnie devoted his time and energies to the study of the rubber industry. Much of the remarkable success of his undertakings is due to his indomitable will and indefatigable energy. A number of improvements in rubber footwear have been the result of his inventive genius. His keen foresight and wise judgment have been recognized as a benefit to the companies with which he has been associated. Mr. McKechnie possessed sterling qualities and his noble character exerted an influence not only on business conditions, but on the community in which he lived. He stood for courage, integrity, intelligence and prudence, and his death is mourned by many personal and business friends.

SIR CLEMENTS ROBERT MARKHAM.

Sir Clements Robert Markham, K.C.B., F.R.S., F.S.A., D.Sc., late president of the Royal Geographical Society, the distinguished scientist, who was prominent in the movement that developed rubber cultivation in the East, died at his home, London, England, on January 30, aged 85 years.

Born at Stillingfleet in Yorkshire, England, on July 20, 1830, of a noted naval family, he entered the navy in 1844. After eight years of service, during which he visited Peru, and also took part in the expedition of 1850-1, that searched for Sir John Franklin,



Photo by Bain News Service.

SIR CLEMENTS R. MARKHAM.

he resigned his commission in 1852 to devote himself to travel and scientific investigation. While in Peru in 1852-4, he became acquainted with the *Cinchona* trees yielding quinine, and with *Siphonias* (*Hevea*), yielding rubber. He introduced the cultivation of *Cinchona* into British India in 1859-62, with the result that the price of this drug was reduced from one pound to one shilling an ounce in London, and it became available for general use.

From 1858-87 Sir Clements served as assistant secretary in India. It was during this period that his rubber activities are of interest. According to an article contributed by him to the March, 1894, issue of THE INDIA RUBBER WORLD, he came to the conclusion in 1870 that it would be desirable to establish plantations of *Ficus elastica* in British India, and also to introduce the best yielding plants from South America.

The first step was the planting of native Indian trees in Assam and other parts. He also planned for the introduction of South American varieties yielding better rubber. He decided that the *Castilloa* seed should first be obtained as these plants thrive in a greater variety of soil and climate than the *Hevea*. The collecting of the needed *Castilloa* plants and seed—a difficult task—he assigned to Robert Cross, who, in 1875, gathered six hundred young plants of the best species. Again in 1876 Mr. Cross was sent to Brazil where he collected 1,080 *Hevea* plants. H. A. Wickham gathered 70,000 seeds the same year. Mr. Cross also proceeded to Ceará where a few young *Manihot* plants were collected together with 700 seeds.

Sir Clements hoped that *Castilloa* trees would find a congenial home in western Ghats, that *Hevea* would thrive in Burma and that Ceará would be extensively grown in the drier plains of India.

His watchful attention to the subject of rubber cultivation had much to do with the establishment of the eastern plantations.

He was secretary from 1863-88, and president from 1893-1905 of the Royal Geographical Society. He wrote books on various subjects as well as editing 25 volumes. His recreation was traveling and topographical research. Sir Clements was Commander of the Order of Christ, Commander of the Pole Star of Sweden and of St. Olaf of Norway.

MORIZ JOSEF REITHOFFER.

Moriz Josef Reithoffer, senior member of the firm of Josef Reithoffer's Söhne Gummi- und Kabelwerke, Vienna, Austria, one of the pioneers in the Austrian rubber industry, died at Vienna, on December 14, 1915, aged 77 years.

Mr. Reithoffer, together with his brothers, Gustav and Robert,

in 1856, continued the small rubber textile business which his father had started in 1832. From a very small workshop in an old residence in the suburbs of Vienna, there was developed the large rubber manufacturing business that today employs many hundreds of hands in its factories at Garsten and Pyrach, near Steyr, in Upper Austria, and at Treusein, in Hungary, where soft rubber articles, insulated wire and cables, tires and general mechanical rubber goods are manufactured.

For years a leading figure in Austrian industrial and commercial circles, Mr. Reithoffer was a "counselor of commerce," a title conferred only on distinguished financiers and men of large business. He possessed exceptional ability, a fine character and strong personality.

RICHARD S. BRYANT.

Richard S. Bryant, factory manager of the Standard Welding Co., Cleveland, Ohio, died at the Post-Graduate Hospital, New York City, on January 28, aged 46 years.

Mr. Bryant was an authority on automobile rims, of which he invented several special types. He organized the Bryant Rim Co., Columbus, Ohio, which was later absorbed by the Diamond Rubber Co., Akron, Ohio. He was then appointed consulting engineer of the United Rim Co., of Akron, a holding company for several rim patents owned by large rubber companies. Later he became consulting engineer of the Standard Welding Co., and also its factory manager. Mr. Bryant was a member of the Standards Committee of the Society of Automobile Engineers.

TH. L. A. RUNGE.

Th. L. A. Runge, said to be the first to introduce rubber planting in Sumatra, died on December 28, 1915, in Hanover, Germany, from injuries received in a street car accident. In 1890 he planted "Boeloe" *Ficus* on the west coast of Sumatra, and in 1900 introduced *Hevea* into his plantations. Two years ago he took up his residence in Hanover, but retained the management of his plantations.

HOLLAND PROHIBITS RUBBER EXPORTATION.

A royal decree issued on January 27, 1916, prohibits the exporting of rubber from Holland. It is understood that this measure will result in Great Britain ordering no further interference with shipments of rubber to Holland. Heretofore rubber cargoes have been held up until it was conclusively proved that they were not consigned to German agents in the Netherlands.

RUBBER CLUB ANNOUNCEMENT REGARDING EXPORTING.

It has been announced by the Rubber Club of America, Inc., that it has recently come to the attention of its Rubber Advisory Committee that some export managers are not familiar with the provisions of the British Rubber Guarantee with respect to export shipments of manufactured rubber goods.

Many manufacturers have obtained lucrative export orders from Scandinavian countries on the express stipulation that the goods be shipped by direct steamer. Members of sales organizations will often go ahead with such orders in evident ignorance of the guarantee which the executive head of their firm has signed, and it is only when they find that the steamship company refuses to take the goods that they come to a proper understanding of the situation.

It makes no difference who the customer in the neutral European country may be, whether it be the Government of that country or anyone else, for under Great Britain's restrictions, all rubber goods must be shipped to a consignee in the United Kingdom and a license obtained from the War Trade department in London for reshipment therefrom.

News of the American Rubber Trade.

THE KELLY-SPRINGFIELD TIRE CO. REPORT.

THE annual report of the Kelly-Springfield Tire Co., New York City, for the year ending December 31, 1915, shows very gratifying profits. The statement in detail is as follows:

STATEMENT OF INCOME AND PROFIT AND LOSS.

Gross profits	\$2,680,000.00
Less: Operating expenses (including selling, administrative and general expenses)	1,130,875.81
Net operating income	\$1,549,124.19
Other income, net: Cash discounts, interest and miscellaneous.	22,537.52
Net income for year	\$1,571,661.71

BALANCE SHEET.

ASSETS	
Cash in banks and on hand	\$705,051.33
Notes receivable	104,277.75
Accounts receivable	\$1,261,238.73
Less reserve for bad debts and discounts	143,556.40
Inventories at cost	1,117,068.83
Deferred charges to operations	1,624,607.92
	30,036.29
Current assets	\$3,881,903.00
Sinking fund on debenture bonds: Cash and debenture bonds purchased	131,750.82
Sinking fund for redemption of first preferred stock	82.00
Treasury stock—6 per cent first preferred	86,800.00
Plant accounts, good will and patent rights, less reserve for depreciation	7,807,323.45
	\$11,607,761.34
LIABILITIES	
Accounts payable	\$60,172.13
Accrued charges	32,849.77
Dividends and interest payable:	
1½ per cent on first preferred stock issued, due January 2, 1916	\$56,373.00
1½ per cent on second preferred stock issued, due January 2, 1916	1,874.25
Interest of 4 per cent on income debenture—bonds outstanding, due April 1, 1916	10,800.00
	69,047.25
Current liabilities	\$182,069.15
Fifty-year sinking fund 4 per cent income debenture bonds	270,000.00
Capital stock:	
6 per cent first preferred	\$3,758,200.00
7 per cent second preferred	72,600.00
Common	4,834,600.00
	8,665,400.00
Sinking fund for redemption of stock and bonds:	
6 per cent preferred stock	\$150,328.00
4 per cent income debenture bonds	142,550.82
	292,878.82
Reserve for bonus distributions	70,674.38
Surplus and working capital per annexed statement	2,126,738.99
	\$11,607,761.34

SURPLUS AND WORKING CAPITAL.

Balance, January 1, 1915	\$1,134,639.15
Additions during year:	
Dividend declared on treasury stock	\$1,302.00
Profit on purchase of 6 per cent first preferred stock	11,718.00
	13,020.00
Balance as adjusted	\$1,147,659.15
Net income for year ended December 31, 1915	1,706,743.77
	\$2,854,402.92
Less:	
Quarterly dividends on—	
First preferred stock, 6 per cent	\$225,492.00
Second preferred stock, 7 per cent	46,490.50
Common stock	265,578.00
	\$537,560.50
Interest of 4 per cent on income debenture bonds, due April 1, 1916	10,800.00
Sinking fund of 4 per cent on income debenture bonds outstanding	10,800.00
Sinking fund of 2 per cent on 6 per cent first preferred stock	75,164.00
	\$634,324.50
Reserve for bonus distributions	70,674.38
Miscellaneous	22,665.05
	727,663.93
Balance, December 31, 1915, as per balance sheet	\$2,126,738.99

THE ANNUAL MEETING OF THE FISK RUBBER CO.

At the annual meeting of the Fisk Rubber Co., Chicopee Falls, Massachusetts, held February 16, lack of time prevented action being taken on the proposition to increase the capital stock of the company by \$10,000,000, consisting of \$5,000,000 in second preferred stock and \$5,000,000 common stock. This matter will probably be taken up at the meeting to be held on March 8.

The regular quarterly dividends of 1¼ per cent. on preferred stock, payable May 1, and on second preferred stock, payable June 15, were declared.

H. G. Fisk was re-elected treasurer and clerk, the re-elections to the board of directors being as follows: Stedman Buttrick, E. H. Broadwell, J. C. Cole, H. T. Dunn, H. G. Fisk, Fred T. Ley and G. A. Ludington. At the directors' meeting the following officers were elected: H. T. Dunn, president; E. H. Broadwell, G. A. Ludington and John Kearns, vice-presidents; R. B. McGaw, secretary and assistant treasurer; E. M. Bogardus, comptroller. J. D. Anderson, E. H. Broadwell, H. T. Dunn, H. G. Fisk and G. A. Ludington compose the executive committee. The appointment of J. D. Anderson as sales manager was confirmed.

HABIRSHAW WIRE & CABLE CO. AND ELECTRIC CABLE CO. MERGED.

The Habirshaw Wire & Cable Co., Yonkers, New York, and the Electric Cable Co., Bridgeport, Connecticut, have merged their financial interests in the new corporation known as the Habirshaw Electric Cable Co. The officers of the new company are: Edwin W. Moore, president; R. S. Satterlee, vice-president; J. Nelson Shreve, treasurer, and G. N. Waterbury, secretary.

Both plants will remain under the same management, but the operating forces will be increased, and extensive plant improvements made to meet the rapidly growing demands for the Habirshaw products.

The machinery of the Waterbury Co., Brooklyn, New York, has been purchased, and will be installed in the Yonkers plant. Here the large underground, high and low tension wire and submarine cables will be made, while the small size insulated wire will be made at Bridgeport, Connecticut.

The general offices of the company are at 10 East Forty-third street, New York City. James B. Olson has been appointed general sales manager. The Habirshaw company was founded 28 years ago by Dr. W. M. Habirshaw, and is one of the oldest concerns in America engaged in the manufacture of rubber-covered wire.

ANNUAL MEETING OF THE PENNSYLVANIA RUBBER CO.

At the annual meeting of the Pennsylvania Rubber Co., Jeannette, Pennsylvania, held on February 23, the following officers were elected: Chairman of board, Herbert Du Puy; president and treasurer, H. W. Du Puy; vice-president, C. M. Du Puy; general manager, Seneca G. Lewis; secretary, George W. Shively; assistant treasurer, C. G. Morrill; directors, Herbert Du Puy, H. W. Du Puy, C. M. Du Puy, Seneca G. Lewis and George W. Shively.

The company's report for the season of 1915 shows approximately a four million dollar volume of business, with earnings the most satisfactory in the history of the company. The already heavy demand experienced for their new product, the "Ebony Tread" tire, necessitates increase in building and heating capacity, and this new business, together with the already heavy fixed demand for vacuum cup tires, necessitates preparation for the production of not less than 2,000 casings daily.

BOILER EXPLOSION IN HOWE RUBBER PLANT.

The Howe Rubber Co., New Brunswick, New Jersey, recently suffered a severe disaster in consequence of a boiler explosion in the boiler-house adjoining the main factory building. The cause remains unexplained, the engineer having been killed by the explosion, which wrecked the boiler-house and destroyed the main factory building by fire. One of the mill men was struck with some bricks and died on his way to the hospital, and five others were injured by flying bricks. The new reinforced concrete factory, which the company planned to use for the manufacture of tires is almost completed, and additions are now being made to this building to care for tubes also, which will be manufactured by March 1.

THE CONTINENTAL RUBBER WORKS.

The new machine shop of the Continental Rubber Works, Erie, Pennsylvania, is shown as completed in the accompanying illustration. The equipment of the building, which is of steel and



NEW MACHINE SHOP OF CONTINENTAL RUBBER WORKS.

concrete construction, was described in the February issue of THE INDIA RUBBER WORLD.

At the semi-annual meeting of the directors, held on February 7, W. J. Surre, manager of the tire sales department, was elected to the newly created office of second vice-president.

CRIMSON SULPHURET OF ANTIMONY.

American rubber manufacturers should be pleased to learn that in the future they will not have to rely upon a foreign source of crimson sulphuret of antimony. After several years of study and investigation, the Rare Metal Products Co., Glen Ridge, New Jersey, announces that it is making a crimson sulphuret which is in every way equal to the best of European manufacture.

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of shares of rubber manufacturing companies on February 25 are furnished by John Burnham & Co., 31 Nassau street, New York City, and 40 South La Salle street, Chicago Illinois:

	Bid.	Asked.
Max Rubber Co. (new)	70 1/2	71
Firestone Tire & Rubber Co., common	740	750
Firestone Tire & Rubber Co., preferred	113	114
The B. F. Goodrich Co., common	71	71 1/2
The B. F. Goodrich Co., preferred	113	114
Goodyear Tire & Rubber Co., common	34 1/2	34 3/4
Goodyear Tire & Rubber Co., preferred	116	117 1/2
Kelly Springfield Tire Co., common	70 1/2	71
Kelly Springfield Tire Co., first preferred	95	97
Kelly Springfield Tire Co., second preferred	23 1/2	24
Miller Rubber Co., common	113 1/2	116
Miller Rubber Co., preferred	108	110
Portage Rubber Co., common	68	71
Portage Rubber Co., preferred	106	108
Rubber Company, Inc., preferred	106	108
Swinehart Tire & Rubber Co., common	88	89
United States Rubber Co., common	51	51 1/2
United States Rubber Co., preferred	106	108
Fisk Rubber Co., common	110	115
Fisk Rubber Co., first preferred	112	115
Fisk Rubber Co., second preferred	110	112

SECRET RUBBER TRADERS FINED.

Heinrich Bachmann and Mrs. Elsie Schroeder pleaded guilty on February 21 of conspiring to violate the customs laws by attempting to carry rubber from this country as personal baggage without manifests. The defendants, according to the assistant United States attorney, said they were private traders, and Judge A. G. Dayton, in the Federal court, find them \$200 each.

INDIANAPOLIS BRANCH OF THERMOID RUBBER CO. REMOVES.

The Thermo Rubber Co., Trenton, New Jersey, announces that the location of its Indianapolis, Indiana, branch has been changed from 128 East New York street to larger quarters, at 409 North Capitol avenue, where a complete stock of mechanical rubber and automobile goods will be carried. The mechanical rubber department is in charge of L. T. Kuhl, formerly of the main office.

Warren B. Wheeler and Stillman Shaw, who operated as Wheeler & Shaw, Inc., charged with fraudulent use of the mails some years ago in connection with the promotion of the North American Rubber Co., will soon be brought to trial in Boston, Massachusetts, according to reports. This company, it will be recalled, was capitalized for \$5,000,000 to manufacture rubber by chemical means.

The American Coal Products Co., New York City, parent organization of the Barrett Manufacturing Co., has united both concerns under the name of The Barrett Co. The new company will have the same amount of stock as the American Coal Products Co., all outstanding certificates being exchanged share for share.

At the annual meeting and banquet of the American Museum of Safety, held February 3 at the Waldorf-Astoria, New York City, the Anthony N. Brady Memorial Medal was awarded to the Union Traction Co., of Indiana, H. A. Nicholl, general manager.

A NEW AUTOMOBILE BUSINESS ASSOCIATION.

The National Automobile Trade Association has been organized at Chicago, Illinois, as a successor of the Associated Garages of America, to create closer harmony between manufacturer, jobber, dealer and garage owner. The officers are as follows: Robert Bland, Evanston, Illinois, president; Robert A. Wilson, Chicago, Illinois, secretary; F. A. Bean, Detroit, Michigan, treasurer. The board of directors is composed of Jacob Friedman, Dyersville, Iowa; E. T. Jones, Akron, Ohio; Walter B. Taylor, Rockford, Illinois; Carl R. Baugh, Indianapolis, Indiana, and L. C. Steers, Detroit, Michigan.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A firm in Colombia desires to represent American manufacturers and exporters of rubber goods. Report No. 20,051.

Representation of American manufacturers of automobile tires is desired by a firm in the Netherlands. Report No. 20,066. Communication with American importers of African rubber is sought by a man in France. Report No. 20,067.

A Brazilian firm wishes to represent American exporters of rubber goods. Report No. 20,132.

An inquirer in Spain desires to purchase waterproof cloth in wholesale quantities from American manufacturers. Report No. 20,231.

A man in the Netherlands is in the market for a large quantity of automobile tires, complete with tubes. Report No. 20,240.

A correspondent in the Netherlands desires to be placed in touch with American manufacturers of flax hose, with and without rubber lining, for use on fire engines. Report No. 20,242.

TRADE NOTES.

The United States Rubber Co., New York City, has reopened the plant of the Lyscoming Rubber Co., Williamsport, Pennsylvania, as an overflow factory for its tennis business.

At a stockholders' meeting on February 1, the Mason Tire & Rubber Co., Kent, Ohio, increased its capital stock from \$250,000 to \$1,000,000, the increase of \$750,000 consisting of \$600,000 preferred stock and \$150,000 common stock. The company's new plant is now under way and it is expected that it will be completed on or before May 15. The building contract has been let to the Akron Storage & Construction Co., Akron, Ohio, for \$49,750.

The Stoddard Rubber Co., Millbury, Massachusetts, is enlarging its plant by an addition of 100 feet to the present building, in which will be installed about \$10,000 worth of tire making machinery. The Stoddard Rubber Co., of New York City, which is to maintain branches in Boston, Chicago and St. Louis, will have charge of sales.

The La Crosse Rubber Mills Co., La Crosse, Wisconsin, will erect two brick, steel and concrete additions, for which plans are being drawn by V. L. Page, consulting engineer, Rockford, Illinois. One will be a four-story building, 60 x 200 feet, and the other, two stories, 40 x 120 feet.

The Gutta Percha & Rubber, Limited, Toronto, Canada, is erecting an addition to its factory on West Lodge avenue.

The Dunlop Tire & Rubber Co., Toronto, Canada, is extending its plant.

The Iroquois Rubber Co., Buffalo, New York, a subsidiary of the United States Rubber Co., operating as a branch store, will hereafter be known as the United States Rubber Co., Buffalo branch.

At the recent annual meeting of the Alling Rubber Co., Albany, New York, the capital stock was increased to \$150,000, and the following officers elected: N. E. Alling, president; S. N. Blakeslee, vice-president; W. C. Minor, secretary and treasurer, and H. A. Sheldon, assistant secretary and treasurer.

The directors of the Ajax Rubber Co., Trenton, New Jersey, have declared a quarterly dividend of 2½ per cent. This dividend is payable March 15, 1916, to stockholders of record February 28.

At its recently held annual meeting the Cincinnati Rubber Manufacturing Co., Cincinnati, Ohio, re-elected last year's officers. The company is erecting new buildings for the accommodation of added lines.

The Schaefer Rubber Co., Cincinnati, Ohio, devised a clever Washington's Birthday souvenir in the form of a rubber hatchet combined with artificial cherries boxed and offered as a memorial to the "Father of his Country."

S. Birkenstein & Sons, 409 West Ontario street, Chicago, Illinois, operators in waste rubber, have recently opened a branch office and warehouse at 134-6 North Front street, Philadelphia, Pennsylvania, with Emil J. Schwab in charge. M. Straus for many years prominently identified with waste rubber interests has become associated with the house of Birkenstein.

The Vulcalose Co., manufacturer of hard rubber substitutes, is now located at 216 West Kinzie street, Chicago, Illinois.

The National Cement & Rubber Co., Toledo, Ohio, will remove to Cincinnati, Ohio, in May.

The Panama Rubber & Equipment Co., St. Louis, Missouri, has recently extended its facilities by leasing further space in the building it now occupies on Locust street. This company manufactures waterproof garments, both in rubberized and cravenetted materials, and also the "Panama Punctureless Cushion" for auto-

mobile tires. The officers are as follows: Carl G. Schwarz, president; G. G. Giese, secretary and treasurer.

A new building is being erected for the Hanover Rubber Co., West Hanover, Massachusetts, which will be used for the trimming, packing, inspecting, stock and shipping departments. Upon completion of this addition, the company expects to have a daily output of from 12,000 to 15,000 pairs of heels and 1,000 pairs of soles.

At the annual meeting of the stockholders of the Chicago Rubber Clothing Co., Racine, Wisconsin, held January 22, the following directors and officers were elected: David G. Janes, president; George G. Bryant, secretary and general manager; E. V. Laughton, treasurer, and James Murphy, Charles E. Wells and Louis Nelson, directors.

President Birkenstein of the National Association of Waste Material Dealers called a meeting on February 14 at the Sherman House, Chicago, Illinois, for the purpose of organizing the Western division, as agreed upon at the last regular meeting of the Association, held in New York City.

The Chicago Rubber Clothing Co., Racine, Wisconsin, is to erect a building 125x65 feet, to be devoted entirely to proofing for the trade. It is expected that the new addition will be completed about April 1, giving an added output of 30,000 yards a week.

The Pouvaillsmith Corporation, Poughkeepsie, New York, mentioned in the January issue of THE INDIA RUBBER WORLD as the purchaser of the Condensate department of the Essex Rubber Co., Trenton, New Jersey, has begun the erection of three buildings which will total 60x340 feet.

The Russian-American Chamber of Commerce, Moscow, Russia, is preparing recommendations on the terms of a proposed Russian-American commercial treaty, and desires information that will assist it in this work.

H. J. Halaburt & Sons, Chicago, Illinois, have removed their offices to the Lytton Building, State street and Jackson boulevard.

The Stamford Rubber Supply Co., Stamford, Connecticut, has increased its capital from \$50,000 to \$100,000.

At the annual meeting of the H. W. Johns-Manville Co., New York City, L. R. Hoff, W. R. Seigle, T. T. Lyman, H. R. Trainer, Harry Gillett, F. B. Smith, J. E. Meek, H. R. Wardell and J. W. Perry were elected members of the board of directors.

Brocmhall's Imperial Combination Code has been added to the list of those authorized for use in foreign cable messages by the British Postmaster-General, although it is not available for use to Argentine Republic, Brazil, Paraguay, Uruguay and the Republic of Honduras.

By a court order obtained by Salvador Madero, a shipment of crude rubber from Mexico to Detroit, Michigan, worth \$50,000, has been held up at San Antonio, Texas, awaiting the establishment of rightful ownership.

The General Engineering Co. has opened an office at 323 Second National Bank Building, Akron, Ohio, and is prepared to handle work in rubber and mechanical engineering.

Under the auspices of the United States Rubber Co., New York City, representatives of the various military organizations in the city gave short talks to the employees of the company on February 24 in the Auditorium of the West Side Y. M. C. A. on the value of military training.

Raymond B. Price, vice-president of the company, urged the men to affiliate themselves with some military organization, both from the view of efficiency as well as patriotic duty. Full time, in addition to their regular vacation, would be allowed to those who joined, as has been the policy of the company in the past.

PERSONAL MENTION.

George B. Hodgman, president of the Hodgman Rubber Co., Tuckahoe, New York, is planning a three weeks' trip to Bermuda early in March.

George H. Pickerell, consul-general at Para, Brazil, is in the United States on a three-months' leave of absence. He can be seen in New York City at the United States Customs House, room 409, Department of Commerce and Labor, mornings between 11 and 12.

Charles B. Whittlesey, vice-president and secretary of the Hartford Rubber Works Co., Hartford, Connecticut, was a passenger on one of the New York, New Haven & Hartford Railroad trains wrecked on February 22, near New Haven, Connecticut, but fortunately escaped injury.

Matthew Hawe, for many years treasurer of the Gutta Percha & Rubber Manufacturing Co., New York City, has retired from the company. The board of directors on February 5 elected to the vacancy, George B. Dickerson, formerly vice-president of the New Jersey Car Spring & Rubber Co., Jersey City, New Jersey.

Henry L. Arbogast, chief chemist of the Portage Rubber Co., Akron, Ohio, has resigned to accept a similar position with the Alliance Rubber Co., Alliance, Ohio.

Thomas G. Richards, president of the B. & R. Rubber Co., North Brookfield, Massachusetts, has been elected a member of the local school board. He has previously served on the town's board of selectmen.

C. H. Williams has been made manager of the Chicago branch of the Goodyear Tire & Rubber Co., Akron, Ohio, and J. A. Leatherman has been appointed manager of the Portland, Oregon, branch.

N. L. Jones, of the Peerless Seamless Rubber Co., Richmond, Surrey, England, was in New York early in February, buying machinery.

Charles R. Haynes has been appointed superintendent of the factory of the Goodyear Metallic Rubber Shoe Co., at Naugatuck, Connecticut.

S. P. Woodward, formerly tire sales manager of the New Jersey Car Spring & Rubber Co., Jersey City, New Jersey, has been appointed vice-president and sales manager to succeed C. B. Dickerson, resigned.

F. E. Titus, branch manager of The B. F. Goodrich Co. at Pittsburgh, Pennsylvania, has been appointed general manager of the Buffalo, Rochester and Syracuse branches of that company. Mr. Titus' headquarters will be in Buffalo, where for eight years he served as assistant manager of the Buffalo branch, leaving here a year and a half ago to assume charge of the Pittsburgh organization. The Buffalo territory comprises thirty-one counties in western New York and nine in Pennsylvania, as well as the Province of Ottawa in Canada.

Wilson C. Dold, who for the past five years has been connected in an important capacity with the Kansas City branch of The B. F. Goodrich Co., Akron, Ohio, has been appointed manager of the St. Louis, Missouri, branch.

G. W. Pritchett has been placed in charge of the North and South Carolina territory of the Morse Chain Co., Ithaca, New York, with headquarters at 805 Ashboro street, Greensboro, North Carolina.

A. J. Fox has been made manager of the Toledo, Ohio, branch of The B. F. Goodrich Co., Akron, Ohio, succeeding H. W. L. Kidder, who was promoted to the Cleveland district.

On February 2 Otto Basten was elected a director of the Rutherford Rubber Co., Rutherford, New Jersey.

H. T. Richards, although with The B. F. Goodrich Co., Akron, Ohio, less than a year, has been appointed branch manager at Memphis, Tennessee.

D. LORNE MCGIBBON.

D. Lorne McGibbon, who retired last spring from the presidency of the Canadian Consolidated Rubber Co., Limited, Montreal, Canada, is now interested in the formation of a syndicate to exploit Canadian industries.

Starting his career as a salesman, he had risen above the salesman stage in the rubber business and was accumulating a modest little fortune when lung trouble developed. Determined to fight the disease before it was too late, he went to live in a camp at Saranac Lake, in the Adirondack Mountains. Finding life there dull and lonesome, he had a special wire run up from Albany and began to watch the stock market. There was no one around to influence him, no one to divert his attention at critical moments. He played the market as his reason dictated, and won, becoming worth several millions. Also, his lungs were entirely cured in less than a year and he is now in perfect health. The popular term "a good mixer" aptly describes Mr. McGibbon's social qualities, and he possesses countless friends.

THE BUILDINGS OF THE LOEWENTHAL CO.

The new warehouse building of The Loewenthal Co., dealer in scrap rubber, at 23 Heyward street, Brooklyn, New York, is seen in the accompanying illustration. This shows the group of



THE BUILDINGS OF THE LOEWENTHAL CO.

buildings used for the handling of material. With large facilities and with all conveniences for work the company feels that with the office now joined to the warehouse, even better service will be rendered to customers than when the office was located in Manhattan.

ANNUAL MEETING OF RACINE RUBBER CO.

At the annual meeting of stockholders of the Racine Rubber Co., Racine, Wisconsin, on January 25, the following directors were elected to serve for the ensuing year: L. B. Patterson, Chicago, Illinois; J. W. Bate, H. L. McClaren, J. Weissbach, L. T. Vance, Stuart Webster and H. C. Severance, all of Racine.

A meeting of the newly elected directorate immediately followed, at which H. L. McClaren was elected president and advisory manager; Stuart Webster vice-president, general manager and treasurer, and H. C. Severance secretary and general sales manager.

The Kansas City Tire & Rubber Corporation, Kansas City, Missouri, which recently acquired the property, plant and business of the Chester Rubber Tire & Tube Co., Chester, West Virginia, announces it will continue the operation of the Chester plant in conjunction with the rubber tire factory now being built and equipped in Kansas City, where the general offices of the corporation are located. W. W. Wuchter, as factory manager, will have charge of all manufacturing departments and Philip Freshwater, former general manager of the Chester company, becomes assistant general manager.

On February 15 an involuntary petition in bankruptcy was filed against the American Tire Co., Saugus, Massachusetts, assignment being made for the benefit of creditors to Arthur P. French.

NEW INCORPORATIONS. WITH AUTHORIZED CAPITAL. ETC., 1915.

Alliance Tire Co., Inc., February 9 (New York), \$5,000. David and Samuel W. Wallach—both of 903 Prospect avenue, and Henry W. Blumberg, 1574 Madison avenue—both in New York City. Auto tires, etc.

Aluminum Rubber & Tire Co., February 14 (Delaware), \$1,600,000. F. L. Buehler, K. M. Dougherty and L. S. Dorsey—all of Wilmington, Delaware. Office, 927 Market street, Wilmington, Delaware. To manufacture rubber tires, tubes, heels, shoes and all other kinds of rubber goods.

American Rubber & Tire Co., The, January 22 (Ohio), \$500,000. L. P. Mauger, G. W. Kratsch, F. H. Snyder and Frank Snyder.

Armor Tread Co., Inc., The, February 23 (New York), \$35,000. John A. Thomas and Jacob W. Holler—both of Fort Edward, and O. S. Humphrey, 159 Bainbridge street, Rochester—both in New York. To manufacture armor treads for auto tires, etc.

Associated Rubber Co., The, January 22 (Ohio), \$150,000. Frank J. Dunkle, Albert D. Wismar, Charles N. Olds and Lawrence J. Johnson.

Automobile Raincoat Co., Inc., February 18 (New York), \$15,000. Isidor I. Zeeman, 400 Manhattan avenue, and Arthur Zittel, 1462 Fifty-third street, both in New York City, and Julius M. Zittel, 1427 Fifty-second street, Brooklyn, New York. To manufacture rubber automobile apparel.

Century Tire Agency of New York, Inc., January 29 (New York), \$600. John Burlinson (president), 700 West One Hundred and Seventy-ninth street; Mortimer P. Arnold (vice-president and secretary), 415 Madison avenue—both in New York City, and John Stuart Eakin (treasurer), Englewood, New Jersey. Office, 15 East Fortieth street, New York City. To represent the Rubber Insulated Metals Corporation of Plainfield, New Jersey, in the sale of its pneumatic automobile tires and tubes in the metropolitan district.

Continental Rubber Co., January 21 (Ohio), \$500,000. G. W. Doerzbach, S. Frohman, J. Dauch, J. T. Sloat and C. E. Sprague. To manufacture automobile tires.

Cosmic Rubber Manufacturing Co., February 4 (Massachusetts), \$10,000. Frederick S. and Elizabeth M. Bryant, and Arthur White—all in Reading, Massachusetts. Office, Reading, Massachusetts. To manufacture and deal in tires, accessories and all kinds of rubber goods.

Dunbar Co., Inc., E. J., February 9 (New York), \$100,000. Etta Mayer, 914 Union avenue, Bronx, New York City; Herman Mendes, 460 Linwood street, and Harry E. Kaplan, 238 Christopher avenue—both in Brooklyn, New York. To manufacture rubber goods of all kinds.

Eureka Cement Co., The, January 27 (New Jersey), \$125,000. James A. Law, 1158 Broad street, and Ross G. Marley, 241 North Eleventh street—both in Newark, and William F. Law, Maplewood—both in New Jersey. Office, 6 Avenue A, Newark, New Jersey. Rubber cement and other goods.

Eureka Rubber Manufacturing Co., Inc., February 16 (New York), \$30,000. Rose Goodman, 264 North Sixth street; Harris Hyman, 366 South Fifth street, and Sal Benjamin, 6622 Nineteenth avenue—all in Brooklyn, New York. To manufacture rubberized goods.

Gordon Webbing Co., Inc., February 21 (New York), \$15,000. Milton Gordon, 700 West One Hundred and Eightieth street; Irving and Alexander S. Gordon—both of 75 East One Hundred and Twenty-first street—both in New York City. Elastic webbing.

Hill Insulating & Manufacturing Corporation, February 24

(New York), \$25,000. Robert R. Hill, 302 Convent avenue, Abbott Leach, 124 West One Hundred and Twenty-third street, and Charles G. Vogel, 2040 Seventh avenue—all in New York City. To manufacture accessories, auto parts, insulation, etc.

Kenton Shoe Repairing & Auto Tire Vulcanizing Co., Inc., February 18 (New York), \$3,000. Frank R. Kenton, 849 Jefferson avenue; William J. Grange, 666 Decatur street, and John M. Wiswall, 515 McDonough street—all in Brooklyn, New York.

Lion Tire & Rubber Corporation, The, February (Indiana), \$150,000. Ferdinand Dryfus, Thomas Follen, William A. Klepper, Patrick F. Freel, Russell K. Bedgood, Harry J. Haarey, George B. Smith, John T. Cullen, Edward Taylor and Thomas Crane. To manufacture tires, casings and tubes.

Mineralized Rubber Manufacturing Corporation, February 7 (New York), \$100,000. Theodore E. Larson, 227 Bowne street, City Island, New York; Samuel C. Worthen, 14 Davis avenue, East Orange, and Henry T. Randall, 26 Woodland Road, Maplewood—both in New Jersey. To manufacture articles from rubber, bakelite, condensate and other substances.

Monarch Tire Co., Inc., February 24 (New York), \$1,000. Fred and William Rothschild—both of 3569 Broadway, New York City, and Joseph Siskins, 971 Westchester avenue, Bronx, New York City. To manufacture tires, tubes, etc.

Muehlstein & Co., Limited, H., January 20 (Canada), \$10,000. Francis Ethelbert McKenna, Joseph Arthur Perodeau, Paul Servillan Conroy, John Mulcair and Henri Baby—all of Montreal, Quebec. Office, Montreal, Quebec. To deal in scrap rubber.

Norka Rubber Co., January 19 (Ohio), \$20,000. J. J. Dildine, W. C. Washburn, H. W. Heckman, C. E. Toutts and W. Dildine. Office, 47 Central Office building, Akron, Ohio. To manufacture a patent inner tube for tires.

Northwestern Tire Co., The, January 25 (Ohio), \$10,000. Carl and E. K. Lemster, C. E. and Otto L. Hankison.

Perfection Tire & Motor Co., Limited, The, (Canada), \$1,500,000. J. H. Christian (president), Fort Madison, Iowa; R. J. Evans (vice-president), Wabash, Indiana; L. A. Rockwell (secretary), and E. A. Stickelman (treasurer)—both of Chicago, Illinois. To manufacture automobile tires, etc.

Sterns Tire & Tube Co., The, January 26 (Delaware), \$500,000. Olin and H. E. Bryan—both of Philadelphia, Pennsylvania, and H. B. France, Wilmington, Delaware. Office, 804 Orange street, Wilmington, Delaware. To manufacture and trade in tires and tubes for automobiles, etc.

Travellers Tire & Rubber Co., January 26 (Delaware), \$500,000. E. P. Dickinson, T. L. Jennings and E. Penuel—all of Philadelphia, Pennsylvania. Office, Bankers' Trust Co., Ford building, Wilmington, Delaware. To purchase, manufacture or otherwise deal in rubber in its raw state.

Union Packing & Rubber Co., Inc., February 15 (New York), \$2,000. Samuel Netwiter, Frank H. Hallefas and Wm. C. Weiss—all of 38 Park Row, New York City. Engine packing materials.

Warwick Rubber Manufacturing Co., January 13 (Ohio), \$20,000. L. Y. Croft, Amos Engleback and J. H. Adams. To reclaim rubber.

The record time for transmitting a message by wireless from the Akron, Ohio, office of the Goodyear Tire & Rubber Co. to its Detroit, Michigan, office and receiving the answer, is four minutes.

The large demand for white footwear will greatly increase the usual sale of white cemented sole tennis shoes for the summer season.

OTIS R. COOK.

OTIS R. COOK, general sales manager of the Kelly-Springfield Tire Co., New York City, who has his offices at Cleveland, Ohio, when a mere lad, back in 1893, started to learn the rubber business. He was first employed by The B. F. Goodrich Co. When H. E. Raymond became sales manager of that concern, he took young Cook out of the office, believing that he



OTIS R. COOK.

possessed qualities that would win success on the road as a bicycle tire salesman. His success was marked and finally earned for him the position of general representative of the company.

In 1906 Mr. Cook became connected with the Firestone Tire & Rubber Co. as special representative. Two years later he accepted a position with the Federal Rubber Co., Milwaukee, Wisconsin, where he remained until 1910. He then was made general representative of the Kelly-

Springfield Tire Co., and in one week he is said to have sold more tires than the company had manufactured during the whole period during which it had made pneumatics.

In 1912 Mr. Cook decided to open a branch in Cleveland, of which he took personal charge. This venture was looked upon with doubt by some officers of the company, but two years later the report is that the business of this office reached the million dollar mark.

In recognition of his valued services, he was then advanced to the position of general sales manager, and in March, 1915, he was made a director of the company. Besides being a salesman of unusual ability, Mr. Cook is a natural leader who inspires the confidence of all with whom he comes in contact. His resourcefulness and ability are shown by the splendid sales organization that he has built up.

MID-CONTINENT CO. ENLARGES DIRECTORATE.

The directorate of the Mid-Continent Tire Manufacturing Co., Wichita, Kansas, has recently been enlarged from five to seven members. A. O. Rorabaugh, a prominent merchant of Wichita, was elected to fill the vacancy caused by the resignation of R. E. Price, former director and general manager of the company. L. H. Powell, president of the Board of Trade, and Henry Lassen, President of the Kansas Milling Co., were elected to the board as additional members. The other directors are: Ransom Stephens, C. D. Darrigrand, C. A. Matson and W. T. Watson.

BRAENDER RUBBER & TIRE CO. OPENS TWO BRANCHES.

The Braender Rubber & Tire Co., Rutherford, New Jersey, has established two new branches. One is located at 1327 Race street, Philadelphia, Pennsylvania, and is under the management of W. L. Porter. The other at 1350-1354 South Michigan avenue, Chicago, Illinois, is under the management of W. J. Heathcock, formerly of the New York branch.

TRADE NOTES.

The Firestone Tire & Rubber Co., Akron, Ohio, held a convention at Columbus, Ohio, on February 17 for the Columbus district, at which 275 dealers and representatives were present. At the banquet, President H. S. Firestone was among the speakers, and E. W. BeSaw, district manager of the Columbus territory, acted as toastmaster.

The Dryden Rubber Co. has purchased property adjoining its present plant at Twelfth street and Kildare avenue and will erect an automobile tire and inner tube factory in the spring.

At a special meeting of the stockholders of The Savage Tire Co., San Diego, California, held January 27, the capital stock of the company was marked and increased from \$1,000,000 to \$5,000,000. Arrangements were also perfected at this meeting for extended additions to the factory buildings and equipment which will allow for a material increase in output.

The Michelin Tire Co., Milltown, New Jersey, is adding about 30,000 square feet of floor space to its plant.

The name of the Cleveland-Ford Tire Co., Ashtabula, Ohio, has been changed to the Pearce Tire & Rubber Co. This change was thought advisable owing to the fact that the name "Ford" created the impression that only Ford sizes would be manufactured, whereas it is the intention of the company to manufacture all standard sizes of tires.

The authorized capital stock of the Worcester Tire Fabric Co., Worcester, Massachusetts, has been increased from \$50,000 to \$100,000; \$36,000 of this increase to be issued and paid for in cash in full.

The Samuel Cupples Wooden Ware Co., St. Louis, Missouri, is going into the manufacture of inner tubes and casings for automobile tires.

The offices of the Favary Tire & Cushion Co., New York City, have been removed from Fifth avenue and Fifty-seventh street to 30 East Forty-second street.

The Hardman Tire & Rubber Co., Belleville, New Jersey, announces the opening of a new tire store at 2728 South Michigan Boulevard, Chicago, Illinois, under the management of J. W. Culver, formerly district manager at St. Louis, Missouri, for the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts.

The Baltimore Sewed Tire Co., recently formed in Baltimore, Maryland, has purchased the tire equipment of the Service Tire & Rubber Corporation of that city. It will enter into the manufacture of tires in a three-story building, which is being prepared for that purpose. T. James Curtin, an Akron, Ohio, man will take charge of the plant.

The Syracuse, New York, branch of the Firestone Tire & Rubber Co., Akron, Ohio, has removed to the spacious new building the company has purchased at the corner of Genesee and State streets. S. E. Douglass continues as manager of the Syracuse branch.

A plant is being erected at Wakefield, Massachusetts, by Thomas E. Dwyer, licensed representative for the Motor Tire Re-construction Co., New York City, for the establishment of the reconstruction tire business. It will be equipped with modern machinery, sufficient to care for 200 to 250 tires a day.

The Akron Repair & Tire Co., Toledo, Ohio, recently increased its capital to \$5,000 and elected new officers. P. J. Hooper, former manager, is now president; S. D. Brewster, vice-president; Raymond Gates, secretary, and William C. Braatz, treasurer. These men, together with Emil J. Ernst, form the board of directors. The company, which is the exclusive agent and distributor of Swinchart tires for northwestern Ohio, maintains a complete vulcanizing plant for repairs.

R. B. TRACY.

The subject of this sketch, R. B. Tracy, has recently been appointed factory representative of the Michelin Tire Co., Milltown, New Jersey. Mr. Tracy's connection with the rubber industry dates from the time he became connected with the Pope Manufacturing Co., Hartford, Connecticut. Eight years ago he joined the forces of the Michelin Tire Co., starting as manager of its Cleveland, Ohio, branch. Four years later he was favored with promotion to the management of the Chicago branch, which included supervision over the Minneapolis, St. Louis, Des Moines, Cleveland and Kansas City branches. Last October his industry and ability were rewarded by his appointment as factory representative. Now all branches west of Philadelphia come under his direction. Mr. Tracy is widely known in both the east and west, and possesses many friends.



R. B. TRACY

LOUIS H. PERLMAN WINS RIM PATENT SUIT.

Judge Lacombe in the United States Circuit Court of Appeals, New York City, on February 15 rendered a decision affirming the findings of Judge Hunt in the United States District Court, who held that the Louis H. Perlman's demountable rim patent (United States patent No. 1,052,270) was valid and infringed by the Standard Welding Co., Cleveland, Ohio.

This is considered one of the most important patent decisions affecting automobiles, as it is estimated that 700,000 of the 1,200,000 automobiles to be constructed this year will use demountable rims. Mr. Perlman has stated that it is not his intention to embarrass private automobile owners and that he will require a moderate royalty from manufacturers of rims.

The Jennings-Sullivan Rubber Co., East St. Louis, Illinois, has become local distributor for the Acme "Red Letter" tires, manufactured by the Acme Rubber Manufacturing Co., Trenton, New Jersey.

PERSONAL MENTION.

E. St. J. Clark, well known in England and Australia in the development of Dunlop tires, was in New York City last month.

F. W. Sherwood, formerly manager of the solid tire department of the Firestone Tire & Rubber Co.'s New York branch, has been appointed New York manager for the Gibney Tire & Rubber Co., Conshohocken, Pennsylvania.

A. C. Galbraith, formerly with the Firestone Tire & Rubber Co., has been appointed district sales representative for the New York State territory of the Knight Tire & Rubber Co., Canton, Ohio, the New York City sales having been placed in charge of Marcus Allen.

E. C. Newcomb has taken the agency for Dayton pneumatic tires, made by the Dayton Rubber Manufacturing Co., Dayton, Ohio, for Boston, Massachusetts, and vicinity. He has organized the Dayton Tire Co. of New England, with quarters at 589 Boylston street, Boston, Massachusetts.

F. Haskell Smith, for several years superintendent of the Federal Rubber Manufacturing Co., Milwaukee, Wisconsin, has accepted the position of superintendent of the Lee Tire & Rubber Corporation, Conshohocken, Pennsylvania.

H. H. Hubbard has been appointed assistant manager of the pneumatic automobile tire department of the United States Tire Co., New York City, for the territory west of the Mississippi river.

THE "GIANT" TIRE TWELVE INCHES WIDE

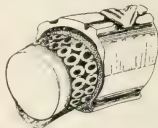
The chief object of this tire is to replace dual equipment for special services, such as on roads with a decided crown, or on unpaved roads.

The "Giant" tire is made in the channel steel hard base pressed-on type in three sectional sizes, 8, 10 and 12-inch. The 8-inch is oversize for dual 4's having about the same volume of rubber as 5-inch duals. The 10-inch is oversize for 5-inch duals; that is, the same volume of rubber as 6-inch duals. The 12-inch is oversize for 6-inch, comparing in rubber volume with the 7-inch.

As originally made, this tire had an extremely high tread. After thorough experimenting, the design was changed and instead of the solid, round section, the present "Giant" has a flat tread, with two circumferential flutes in the 8 and 10-inch sizes and three flutes in the 12-inch. [Firestone Tire & Rubber Co., Akron, Ohio.]

VACUUM CUP SHOCK ABSORBING LINERS.

By the insertion of vacuum cup shock absorbing liners, rim-cut tires that are practically worthless may be used until the carcass is worn threadbare. It is claimed for the vacuum cups that they eliminate at least 85 per cent of the bearing surface, and thus do away with friction, which is always detrimental to the life of a casing.



The vacuum cup liner acts the same as an inner shoe and entirely envelops the tube. The feather-edge coming between the two beads and channel of the wheel, laps over three rows of vacuum cups. Inflation of the tube automatically locks the liner, which is held in position by the action of the vacuum cups. [F. S. Bryant, Reading, Massachusetts.]

THE "CLINCHER CROSS" TIRE.

The "Clincher Cross" tire shown in the accompanying illustration is claimed to possess unusual non-skidding qualities under all conditions of road, owing to the unique formation of the tread design. On roads rendered dangerous by ice or wet asphalt, this tire is said to possess qualities that render its use safe where steel-studded tires are often dangerous. The increased thickness of the tread offers large wearing surface, reduces liability to puncture and tends to produce high mileage. This tire has seen severe military service upon the continent and the manufacturer claims to possess records showing 15,000 miles on ambulance work without changing the tires. [The North British Rubber Co., Limited, London, England.]



The McGraw Tire & Rubber Co., East Palestine, Ohio, has recently placed on the market a new S. A. E. American type truck tire in addition to its "High Profile" European type tire. A black tread with white side walls will be a distinguishing mark of the McGraw tires this year.

The Gordon Tire & Rubber Co., Canton, Ohio, has appointed A. W. Senz manager of a branch recently opened at the corner of East Ohio and St. Clair streets.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

AT the annual meeting of the board of directors of The B. F. Goodrich Co., B. G. Work was elected president; A. H. Marks, E. C. Shaw and H. E. Raymond, vice-presidents; C. B. Raymond, secretary, and W. A. Means, treasurer. The offices of second vice-president and general manager have been abolished. W. O. Rutherford, formerly assistant sales manager, was made general sales manager, which position was relinquished by H. E. Raymond, who will, however, continue to exercise active supervision over sales and advertising policies.

Mr. Rutherford has been connected with the company for 17 years. Starting as a salesman, he has served as branch manager at Denver, Detroit and Buffalo. From Buffalo he came to the home office nine or ten years ago as assistant to H. E. Raymond, then general sales manager.

It is estimated that The B. F. Goodrich Co. is spending \$25,000 yearly for the protection of the health of its employees, which is twice what the entire city spends for the health of its citizens.

The Goodrich company is making extensive additions which, it is said, when completed, will make its plant the largest rubber factory in the world.

From the surplus at December 31, 1915, the directors voted to set aside \$1,700,000 to increase the reserve for contingencies from \$300,000 to \$2,000,000, together with a sum of \$100,000, as an initial amount, for a pension fund. The directors were led to appropriate this amount for contingencies on account of the general unsettled conditions existing throughout the world and the consequent desire to reinforce the fund available to meet unfavorable conditions should they arise.

The following tabulated statement of the year 1915 shows larger net earnings than the advance statement published in the February issue of THE INDIA RUBBER WORLD:

	1915.
Net sales	\$85,416,866
Manufacturing, selling and general administration expenses	42,835,908
Net profit from operation	\$12,590,957
Miscellaneous income	467,690
Total income	\$13,058,648
Depreciation	\$734,344
Reduction of preferred stock	11,878
Interest on bills payable	46,546
Net profit	12,265,679
Pretaxed dividend	1,960,000
Surplus	*10,305,679
Appropriation for contingencies	1,700,000
Preferred stock redeemed	1,100,000
Pension fund	100,000
Previous surplus	3,177,910
Profit and loss surplus	10,583,589

* Equal to 17.12 per cent earned on \$60,000,000 common stock, against 5.62 per cent on same stock previous year.

Reduction of treasury preferred stock from cost to par value.

The consolidated balance sheet as of December 31, 1915, compares as follows:

ASSETS	
	1915.
Real estate, buildings, plant, good will, etc.	\$71,502,099
Inventory of other goods	1,213,477
Preferred stock in treasury	775,700
Stock of The B. F. Goodrich Co.	2,121,140
Current assets	31,242,023
Deferred charges	331,793
Total	\$107,086,232
LIABILITIES.	
	1915.
Common stock	\$60,000,000
Preferred stock	28,000,000
Current liabilities	4,402,642
Reserve for contingencies	2,000,000
Pension reserve	100,000
Surplus	10,583,589
* Appropriation	2,000,000
Total	\$107,086,232

* Appropriation from surplus for redemption of preferred stock.

The Goodyear Tire & Rubber Co. has purchased a large tract on Market street, opposite its plant, and will erect a garage, estimated to cost \$50,000.

English and citizenship classes are being organized for the benefit of the 1,000 men of alien birth employed at the Goodyear factory. Announcements of the proposed classes have been printed in seven languages and distributed throughout the plant. In the English classes speaking, reading and writing will be taught, and for citizenship the instructor will cover such subjects as history, the fundamental principles of American government, and the geography of our country.

A new organization of general office employees of the Goodyear company has taken over "The Colony," the old F. A. Seiberling residence on Market street, for a community club house. A steward and housekeeper have been installed and the building is newly furnished. Present accommodations limit the membership to 27 men.

C. W. Seiberling, vice-president of the Goodyear Tire & Rubber Co., gave a dinner on January 28 to 165 employees of the company, including foremen and department managers. The meeting is the beginning of a plan to bring employees of the company into closer touch with department heads and foremen, and to interest them in educational movements and hygiene.

The General Tire & Rubber Co.'s new plant of steel and concrete construction, located in East Akron, is equipped with the latest machinery and devices, and has both water and rail facilities. M. O'Neil, the president, was formerly owner of a local department store and is prominently identified with tire fabric and other interests in Akron. W. O'Neil, the vice-president and general manager, formerly operated the Western Tire & Rubber Co., with which organization W. E. Fouse, the secretary, was also connected. T. T. O'Neil, son of the president, is the manager of publicity. The factory staff is as follows: Charles Jahant, superintendent; Robert Iredell, assistant superintendent, and H. B. Pushe, chemist. The latter was formerly chemist for the Goodyear Tire & Rubber Co.

An orchestra has been organized among the employees of the Firestone Tire & Rubber Co., with S. W. Dickinson, of the order department, as director.

The swimming pool of white glazed tile for the new Firestone club house will be 61½ feet long, 20 feet wide, 8 feet deep at one end and 4 feet deep at the other.

The American Tire & Rubber Co. has recently reorganized. The newly elected officers are: F. H. Snyder, president; Charles Dietz, vice-president, and George W. Kratch, secretary and treasurer. The new directors are: Fred H. Snyder, Frank H. Snyder, I. M. Taggart, A. J. Waltz and Louis P. Mauger. The company will make tires, tubes and accessories.

A Sunday school class for rubber workers has been organized at the Grace Methodist-Episcopal Church in East Akron. It is the first of its kind in the city and is known as the Rubber City Men's Bible Class. Its activities are to be social as well as religious.

The Akron Double Tread & Tire Co. is planning the construction of a two-story reinforced concrete factory addition, to cost \$30,000.

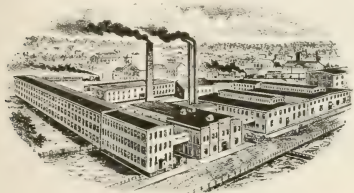
The Miller Rubber Co. has taken out a permit for a new three-story factory building, to cost \$18,000, at Getz street and Cole avenue.

The Mohawk Rubber Co. has increased its output from 250 to 350 tires per day.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

GENERAL PROSPERITY is visiting the various branches of the rubber trade, and the expectations are that he will make a lengthy stay. Mechanicals are having a good call. There is joy for the belting men in the scarcity of leather, and the consequent increased demand for rubber belting. A call for fire hose is always expected soon after town-meeting days in March. Orders for garden hose begin to flow at the same time. Clothing manufacturers already have more business than they can comfortably handle and salesmen now out are sending orders for more. The tire manufacturers are busy right along with orders ahead, and no trouble has been found in securing business at the advanced prices. Druggists' sundries are, at least, normally active.



THE STOUGHTON RUBBER CO.'S FACTORY.

Since the second week in February, New England has had all the snow it cared for, and while the general public may not have been pleased with the snow, thaw and slush, the rubber boot and shoe trade has flourished.

Occasionally a traffic policeman is run over or crowded between moving vehicles, and some have been severely injured. It is claimed that the dark uniforms they wear, especially the black rubber coats, blend too easily with rain and fog. Some time ago a prominent rubber clothing man endeavored to interest the police officials in the matter of apprelling their crossing officers in white rubber uniforms on rainy and dark days, but no sale was made.

Late in January a mechanical traffic regulator was put on trial at Winter and Tremont streets. This was in charge of its inventor, who, on a rainy day, donned a complete suit of white rubber, a cap with shoulder cape, overcoat with cape, and rubber boots. This man was so much more conspicuous than the police officer stationed near him that the question was at once on the lips of pedestrians, teamsters and motorists, "why shouldn't the police be so dressed?"

Undoubtedly there are arguments in favor of making the "Traffic King" more conspicuous than he is today, encased in a black rubber coat. It would be a good sale for some concern to outfit 130 or 140 policemen with white rubber helmets, coats and boots, but so far, no one has been smart enough to secure such an order.

The Revere Rubber Co., whose main office and factory are at Chelsea, has leased the second floor in the handsome new business building, 62 High street, where it will move its Boston office. The accounting and sales departments will be located here, and stock will be carried to fill detail orders. This new location is especially appropriate for the business, being situated in a section very largely devoted to machinery and lines to which this company caters.

The American Rubber Co. exhibited its line of clothing samples to its western jobbing customers at Chicago, Illinois, on Feb-

ruary 14, and to its middle states customers at New York City on February 23 and 24. On these dates the orders are taken for samples, and these are combined and put through the factories as one order, and then all shipped simultaneously, so that no favoritism is shown. All the jobbing houses thus receive their samples on approximately the same date.

Mention was made last month of the consolidation of the American Rubber Co. and the Stoughton Rubber Co., and the removal to new offices and salesrooms early this month. This combined concern is the largest manufacturer of rubber and rainproof clothing in the world. The first-mentioned company manufactures 3,000 garments per day, and the latter 1,200. It is the intention of the new management to increase this by about 20 per cent. in the near future.



THE AMERICAN RUBBER CO.'S FACTORY.

This merger will remove from the trade lists the time-honored name of the Stoughton Rubber Co., though only in name will the change be noted. All its specialties will be made as heretofore, and its customers served as they have been in the past. The history of the Stoughton Rubber Co. is interesting. It began in 1877 as the Mystic Rubber Co., with a capital of \$13,000. Ira F. Burnham, who at the time of its organization became one of its two traveling salesmen, was made superintendent and manager in 1881. This company was the second to manufacture rubber gossamer garments, the cloth being coated in Stoughton and the garments made up in Boston. In 1883 the manufacture of calendared clothing was begun and much machinery was added.

In February, 1889, the Stoughton Rubber Co. was organized, with a capital of \$100,000, to succeed the Mystic Rubber Co. In April of the same year the capital was increased to \$200,000, and the company took over the assets and good-will of the Hall Rubber Co., of Watertown, Massachusetts. New buildings were added, and the stitching department removed to Stoughton, where this company was the first to discard foot-power sewing machines for steam power in the manufacture of rubber clothing. In 1893 the company started the manufacture of mackintosh clothing, and two years later a line of cravenette rain garments was added. Mr. Burnham became president and general manager in 1903. Since then the history has been one of steady progress. Large additions to the plant have been frequent, tenement houses for its workmen have been built, and the works now employ between 300 and 400 hands.

The history of the American Rubber Co., of East Cambridge, is too well known to need telling here. This immense plant is devoted to the manufacture of footwear and clothing. The latter department has been under the sales management of N. Lincoln Greene, who is well known throughout the entire trade. In the new organization, in which both Messrs. Burnham and Greene are vice-presidents, Mr. Greene will be manager of the clothing department, while Mr. Burnham will have general oversight of manufacturing. Mr. Greene will have as assistant manager of the clothing department Ellsworth H. Hicks, who was vice-president and principal salesman of the Stoughton Rubber

Co. Lester Leland remains president of the company, Homer E. Sawyer general manager, H. H. Nance treasurer and E. F. Dewing clerk. The remaining directors are A. L. Comstock and H. E. Converse.

The Converse Rubber Shoe Co. has let the contract to enlarge its present factory building, making its width 90 feet, instead of 60 feet. There will also be built a four-story, reinforced concrete addition 150 feet long, 68 feet wide. The present storehouse on the west side of the Boston & Maine Railroad track will be used exclusively for the increasing tire business of the company. A new four-story storehouse 200 feet long is now being erected. This will give the company much needed storage room. The capacity of its footwear department will be increased from the present output of 8,000 pairs to a daily capacity of 15,000 pairs.

The stockholders recently voted to increase the capital stock from \$700,000 to \$950,000 by selling 2,500 shares of non-redeemable, 7 per cent. cumulative preferred stock.

The Boston Woven Hose & Rubber Co. will advertise its business by a series of moving picture films, showing all the processes pertaining to the various lines of goods it makes. The photographs are being taken under the direction of Mr. Conder, who is preparing a lecture to accompany them. When the factory films are added to those illustrating the various stages of gathering, smoking and shipping the crude rubber, every step will be shown from the trees in the forests of South America or on the plantations of the Far East, to the perfected goods as made in the rubber factory in Cambridge. Such an illustrated lecture will be instructive as well as entertaining, and at the same time should prove a practical advertisement.

Artistic window cards and posters announce the Automobile Show, which will be held at Mechanics' Building beginning Saturday evening, March 4, and lasting through the following week. From present indications this will be far more elaborate than any previous show.

Among the members of the trade who have been fleeing from the frozen north to summer climes, we might mention E. H. Clapp, who, at last accounts, was playing golf at Bellair, Florida.

Francis H. Appleton is at Miami Beach, Florida. Friends are expecting him to send north a few dozen tarpon.

W. H. Porter, manager of the United States Rubber Co., of New England; D. E. Gray, manager of the Beacon Falls Rubber Shoe Co., and Horace G. Cressenger, manager of the Arco Rubber Co., were special guests at the meeting of the New England Shoe Wholesalers' Association held February 2 at Young's Hotel.

The Monatiquot Rubber Works Co., of South Braintree, manufacturers of "Naturized" rubber, has completed additions to its plant, which will increase its output 25 per cent. This factory is running day and night, and it is understood that plans are under way for additional equipment.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

THE Rubber Manufacturers' Association of Trenton has been formed in this city and its membership list includes the representatives of every plant in Trenton. The main object of the organization is to promote cooperation between the men of the shops and the heads of the concerns. It is believed the formation of the association will prove mutually beneficial to the employers and employees alike.

At the first meeting the following officers were elected: John A. Lambert, treasurer of the Acme Rubber Manufacturing Co.,

president; John S. Broughton, president of the United & Globe Rubber Manufacturing Cos., vice-president; Robert J. Stokes, secretary of the Thermoid Rubber Co., secretary; Alfred Whitehead, treasurer of the Whitehead Bros. Rubber Co., treasurer. A constitution and by-laws were adopted and a number of committees will shortly be named to look after the various activities of the association. A permanent meeting place will also be provided shortly. Meetings are to be held monthly.

John S. Broughton is the new president of the United & Globe Rubber Manufacturing Cos., having been chosen at a recent meeting of the stockholders to succeed the late Watson H. Linburg, whose death was chronicled in the last issue of THE INDIA RUBBER WORLD. Mr. Broughton is one of the best-known rubber men in the country. He has been connected with the trade for the past 25 years, having become associated with the United Rubber Co. before it was consolidated with the Globe company about 15 years ago. H. B. Tobin, a son-in-law of the late Mr. Linburg, has been elected secretary and treasurer of the company.

There will be no change in the policy of the concern, and the same lines as formerly will be manufactured. The ownership of the extensive plant is now vested in the estate of Watson H. Linburg and Mr. Broughton. The company is prospering and found it necessary not long ago to erect a three-story building 200 x 50 feet to take care of increasing business.

E. B. De Vere, who has been covering the Middle West as a traveling man for the Essex Rubber Co., has been placed in charge of the Chicago, Illinois, office of this firm. No announcement is made as to a successor to Mr. De Vere on the road.

The Essex Rubber Co. is running night and day, turning out orders. The new inner tube department is working at capacity.

The Royal Rubber Co. will shortly begin manufacturing a line of rubber toys. If the venture is a success the business will be taken up on an extensive scale. Considerable new machinery has already been installed in the plant for this purpose. The company is now making a specialty of ice bags.

General C. Edward Murray, treasurer of the Empire Rubber & Tire Co. and of the Crescent Insulated Wire Co., was informed that the employees of his plants intended taking up a collection to be given as a "free will offering" to Billy Sunday. He promptly announced that whatever sum the men raised he would double. It is said the men were most generous in their donations. The General had to write a pretty fat check, but we kept no record.

The late William S. Hancock, who was extensively identified with the rubber trade, was honored at a meeting of the board of Directors of Mercer Hospital, when a bronze memorial tablet was unveiled. Mr. Hancock was a director of the hospital for 20 years and contributed generously toward the support of the institution. By his will, he made the hospital the residuary legatee of his estate.

At the annual meeting of the Globe Rubber Tire Co., which was held on February 1, the following officers were elected: Horace B. Tobin, president; John S. Broughton and Henry L. Joyce, vice-presidents; Harry B. James, treasurer, and Joseph P. Hall, secretary and assistant treasurer.



JOHN S. BROUGHTON.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent

CONTINUED and, if anything, increasing activity is the rule in the rubber industry of this state. All of the manufacturing plants through Rhode Island are being rushed to the limit of present facilities. There is plenty of opportunity for several hundred additional employees, if competent, and more than one concern would immediately increase its factory capacity if desirable help could be obtained. That Rhode Island is not the only place where a shortage of desirable help is being experienced may be gathered from the number of advertisements appearing in the local newspapers calling for experienced rubber workers to take positions in plants in other sections of the country.

Orders for hundreds of cases of rubber footwear came to hand after the stormy weather in the early part of February, materially accelerating conditions and causing heavy inroads on stocks.

The 500 employees at the Woonsocket plant of the American Wringer Co. the first of the month received an increase of 5 per cent in wages. The new superintendent, Jesse P. Walsh, is making changes and improvements beneficial to the employees. Mr. Walsh, who was chosen to succeed the late Michael M. Flynn, has been with the company 43 years, 35 of which he has been either foreman or assistant superintendent.

At the annual meeting held a few days ago no change was made in the list of officers, the six former directors being re-elected. The statement for the year ending December 31, 1915, shows gross earnings, \$179,597.75; reserve from 1915, \$15,000; expenses, \$116,676.92; surplus on January 1, 1915, \$180,000; dividends paid, \$85,125; dividend declared payable January 15, 1916, \$28,375; depreciation, \$4,420. The surplus on January 1, 1916, is \$140,000.

The Phillips Insulated Wire Co., of Pawtucket, is seeking to have its capital stock increased to \$2,500,000. A bill to authorize the issuing of 25,000 shares of common stock with a par value of \$100 has been introduced in the Rhode Island legislature, and referred to the Senate committee on corporations. The company was chartered at the May session, 1892, with a capital stock of \$100,000. The incorporators were Herbert O. Phillips and Edgar B. Phillips.

The plant of the National India Rubber Co. at Bristol is being operated almost exclusively to the production of tennis shoes, though large quantities of insulated wire are being shipped for export. The tennis shoe production of this plant during February was far in excess of any previous month in the history of the concern.

Edward E. Bunn, secretary to Vice-President Le Baron C. Colt, of the National India Rubber Co., who was confined to his house at Bristol since the middle of the month by an attack of diphtheria, is slowly convalescing.

Colonel Samuel P. Colt, president of the United States Rubber Co., is planning numerous improvements and additions to his country estate at Bristol, and has engaged Frank A. Crabb, an engineer from Williamsburg, Ohio, as superintendent. The new barn is practically completed on the exterior, and work is being pushed on the interior of the building, which is to cost approximately \$100,000.

Colonel Colt left Providence about the middle of the month in his private car, with a party of friends, for Washington and Palm Beach, Florida. They remained a couple of days at Washington, and will stay at Palm Beach about ten days.

AUTOMOBILE SHOW CALENDAR FOR MARCH.

- March 1-7.—Fargo, North Dakota. Auspices, Gate City Automobile Show Corporation. W. M. Bell, manager.
- March 4-11.—Boston, Massachusetts. Fourteenth annual show. Mechanics' Hall.
- March 8-11.—Davenport, Iowa. Tri-City sixth annual show. Coliseum, G. F. Bermeister, manager.
- March 8-11.—Mason City, Iowa. Second annual show. Auspices, Local Automobile Dealers. Armory, W. H. Hathorn, secretary.
- March 8-11.—Moline, Illinois. Annual Tri-City show. Promoter, Tri-City Automobile Trade Association.
- March 8-11.—Rock Island, Illinois. Annual Tri-City show. Promoter, Tri-City Automobile Trade Association.
- March 8-15.—Brooklyn, New York. Annual show. Auspices, Brooklyn Motor Vehicle Dealers' Association.
- March 13-18.—Reading, Pennsylvania. Berkshire Hotel.
- March 15-18.—Trenton, New Jersey. Armory, J. L. Brock, manager.
- March 21-25.—Deadwood, South Dakota. Auditorium. Auspices, Deadwood Businessmen's Club, G. K. Kilter, manager.
- March 28-April 3.—Manchester, New Hampshire. Auspices, Couture Brothers' Academy.

INFLAMMABILITY OF GASOLINE VAPOR WITH AIR.

Interesting data on the inflammable limits of mixtures of gasoline vapor and air, together with the method of determining the gasoline content in such vapor are given in Technical Paper 115, recently issued by the Department of Interior, Bureau of Mines, Washington, D. C.

The tests for the range of explosion were made in a Hempel explosion pipette. Combustion was deemed complete when upon the ignition of the mixture, flame filled the vessel as far as could be judged by the eye. Measuring the percentage of gasoline vapor in the mixture it was found that no visible results were obtained until somewhere between 1.9 and 2 per cent. gasoline vapor. At 2 per cent. there was complete inflammation. Experiments showed that complete inflammation resulted up to as high as 6 per cent., after which only incomplete inflammation resulted.

Another set of experiments brought the figure at the lower limit down to 1.5 per cent. gasoline vapor. This was for gasoline of 73 degrees Baume. A new set of experiments was made to determine if the low limit for 73-degree gasoline was different from that of what is known as cleaners' naphtha which has a Baume rating of 59 or 60 degrees. It was found that complete inflammation started between 1.4 and 1.5 per cent. gasoline vapor. Roughly, it may be stated therefore, that a mixture is explosive between the ranges of 1.4 and 6.4 per cent. gasoline vapor as far as complete combustion is concerned.

SIX USES FOR AN OLD RAINCOAT.

Wearing apparel discarded by the original owner as unsuitable for further service is often made over for the use of another, but seldom is any garment capable of conversion into quite so many articles of utility as those suggested for the worn-out raincoat. These suggestions, which were evidently compiled by some housewife become adept by long experience in the art of "making ends meet," are as follows: First, rip the raincoat apart and wash it thoroughly, after which it may be turned into: A large apron for household use—when scrubbing or washing; a chemistry apron for the daughter in high school; a dusting cap and sleeve protectors; cases for sponges, brushes and toilet articles; a cover to tie over the laundry basket, and a lining for the laundry basket when the soiled linen is sent to the "wet wash." Thus, whenever father and the boys come out in new up-to-date raincoats, mother and the girls may indulge in comfort and protection limited only by their ingenuity and the sizes of the discarded garments.

The Rubber Trade in Germany.

By Our Regular Correspondent.

SINCE our country settled down to war conditions commercial and industrial progress has been regular and from month to month conditions have slowly but steadily improved. With the exception of the building trade and the textile industries all has been moving on as smoothly and as satisfactorily as could be expected considering the many difficulties incidental to war. Our rubber industry is in some instances more busy, in others less occupied than it would be at this season in normal years. Most tire factories are well provided with orders and the cable and insulated wire industry is doing well.

The readers of THE INDIA RUBBER WORLD will no doubt be interested in the following brief review of the past year.

REVIEW OF THE YEAR.

In spite of the war which had been progressing for five months, the year 1915 began under conditions that were not unpromising to our commercial and industrial life.

The available supplies of both crude and manufactured materials were surveyed, and in some instances, were taken over by the government or by organizations created by our rulers, and their distribution was made to the best of all interests. While our armies were fighting, the inventive, resourceful German minds were working and creating serviceable substitutes for materials and goods that threatened to be scarce.

Trade was throughout the year confined to the domestic markets and to the neutral countries; Sweden, Norway, Denmark, Holland and Switzerland. Towards the end of the year, however, Great Britain began to exercise so close a control over the trade of these countries that they stopped sending us raw materials and we were obliged to curtail our sales to them.

THE RUBBER SITUATION.

The rubber manufacturers who had orders for the army and navy, were very busy at the beginning of the year, while the others had very little to do, chiefly on account of the high cost of raw materials and the scarcity of skilled labor.

Manufacturers, who had finished goods in stock, did a good business, because the public realized the situation and purchased heavily, providing for the future. Payments were generally satisfactory although long credits were frequently looked for.

The heavy purchases and the measures taken by the government to preserve sufficient crude rubber for the needs of the army and navy forced rubber manufacturers early in 1915 to begin extensive manufacturing of substitute or "war qualities" and many rubber factories abandoned most of their rubber goods to take up the manufacture of other lines of merchandise. Such changes were not unaccompanied with great difficulties, as will be readily realized by practical rubber men.

No novelties in rubber goods appeared during the year, but their absence was more than made up for by the almost complete lines of substitute goods provided by our manufacturers who justly consider these "war qualities" as the greatest achievement of the German rubber industry. Our people have learned that they can do without imported rubber goods and our manufacturers believe that in the future they will have a far greater share of the home business than formerly. The war has, further, done away with many evil practices in systems of delivery and payments that had grown into our rubber trade and which we trust will not appear again in the future.

TIRES.

The enormous consumption of solid and pneumatic tires by our army has given our manufacturers all they could handle in this line. Towards the end of the year, however, army orders were mostly completed and factories became less busy. The cycle tire

industry, however, was not favored by war conditions. Only reclaimed rubber was available for making casings and only very limited quantities of crude rubber were allowed for inner tubes. Then came the restrictions on the use of cotton fabrics which practically stopped the manufacture of cycle tires for other than military purposes.

RUBBER TOYS AND DRUGGISTS' SUNDRIES.

There was practically no call for rubber sporting goods, toys, articles of luxury and the like and had a demand existed the lack of the necessary raw materials would have greatly curtailed manufacturing even in substitute qualities. As an instance of the effect of the crude rubber shortage, nipples, which prior to the war were being made of transparent stock, have reverted to the old-fashioned red and black qualities.

Business throughout the year was very slack in sanitary and surgical rubber goods, because the essential, fine crude rubber could only be had for military purposes and skilled labor, which is very important in this line, was really scarce.

MECHANICAL GOODS.

Some manufacturers of mechanical rubber goods report good business, while others are dissatisfied. As few new machines were installed, and most old machines worked far less than in normal times, there naturally was no great demand for rubber mechanical goods. Their sale was further reduced by the stagnancy that prevailed in the building trades. During the summer much was expected of increased agricultural activity and from the extensive use of machinery in this line but this field did not prove to be sufficient to offset the lack of business in other lines.

RECAPITULATION.

In spite of the lack of crude rubber, of the shortage of skilled labor, the lack of naphtha, alcohol, sulphur and other accessory materials, in spite of the increased cost of coal and of lighting material, not to mention the curtailed home trade and the almost total interruption of foreign intercourse, our rubber industry is still healthy and full of life. It has learned the value of substitutes and will use its knowledge in the future if any one attempts to withhold crude rubber supplies.

TRADE NOTES.

The Verband Deutscher Gummiwaren-Industrieller, G. m. b. H. was recently organized at Barmen with 20,000 marks [\$4,760] capital, to promote the commercial interests of German manufacturers of textiles for the rubber industry.

Gollert-Reifen, G. m. b. H., is the name of a new 50,000 mark [\$11,900] corporation recently formed in Berlin to manufacture and deal in automobile tires in general and the Gollert patent tire in particular.

The Vereinigte Dürerer Treibriemenfabriken G. m. b. H. at Düren has been incorporated with a stock capital of 60,000 marks [\$14,280] to manufacture transmission belts, waterproof covers and tents.

At a recent joint meeting of the leading organizations of manufacturers and dealers in cycles and motor vehicles, a resolution was passed emphasizing to dealers the importance of economy and advising them to exercise a maximum of care in repairing worn tires, to be cautious to discard none unless absolutely beyond repair and informing them that they should not stock too much rubber solution because the present qualities dry up fast even when sealed in tubes and should therefore be sold rapidly. The attention of dealers was also drawn to the necessity of holding old and worn tire valves which they are permitted to sell only in lots and after obtaining permission. A petition to the

Imperial Chancellor was prepared asking that he permit the release for private use of sufficient quantities of rubber solution and rubber sheet to make inner tubes.

The Erste Deutsche Special Hartgummifabrik G. m. b. H. was recently incorporated at Königstein with 30,000 marks [\$7,140] stock capital, for manufacturing hard rubber goods.

Imhof, Bocholtz & Vogeler, Barmen, manufacturers of rubber bands, presented their employes with a week's pay on the day before Christmas. Wives of workmen now in the field received a money present amounting to more than one week's salary, and the men at the front were also remembered.

Dr. William Berghegger and Paul Jander have been made substitute directors of the Reinische Gummi & Celluloid Fabrik, Mannheim, Neckarau.

Arthur Schalkau has been made business manager of the Gummifabrik Westend, Spadau.

PERSONALS.

Professor Dr. Harries, director of the chemical laboratories of the Kiel University and noted for his works on synthetic rubber, has resigned to become a director of Siemens-Schuckert Werke, Berlin.

Georg Oehlschlägel, of the Asbest-und Gummiwaren-Firma Reinhardt Leupolt, Dresden, was recently presented with a diploma of recognition by the Dresden Chamber of Commerce.

AUSTRIA.

The Helsingborgs Gummifabriks A. G. recently held its annual meeting of shareholders in Vienna and declared a 6 per cent dividend.

It is reported from Buda-Pest that, in spite of the cutting off of all imports of crude rubber, the Hungarian Rubber Goods Manufacturing Co. has, by modifications of its methods, been able to produce the most needed rubber articles. An extraordinary meeting of shareholders was held recently, and it was decided to increase the capital stock from 1,500,000 to 6,000,000 crowns [\$304,500 to \$1,218,000]. A dividend of 10½ per cent was declared.

THE SITUATION IN RUSSIA.

By a Special Correspondent.

WAR has brought about great changes here in Russia. The impossibility of any extensive exports and the difficulties of domestic transportation, coupled with enormous wheat crops, have resulted in great congestion and in the accumulation of enormous quantities of foodstuffs and other merchandise. In many districts the accumulation of wheat has become so large that it has been found necessary to turn even the churches into granaries, while in other districts famine is rampant, due to a lack of shipping facilities.

Generally speaking, the masses are more prosperous now than in normal times. The mobilization has made labor less plentiful than heretofore and wages all have greatly increased. Unskilled labor that formerly earned less than 50 cents per day is now receiving as high as \$3, and the prohibition of the sale of intoxicants prevents the lower classes from turning the bulk of their wages into vodka, as in the past.

The result is clearly shown in the operations of the Government Savings Banks. During the month of November there was an increase in deposits of 47,600,000 rubles [\$24,514,000], and the total deposits on December 1, 1915, amounting to 2,384,200,000 rubles [\$1,227,863,000]. The increased prosperity is evidenced by greater expenditures for wearing apparel, including greater consumption of rubber footwear. It is now common to see galoshes worn by people who before the war could not afford "rubbers," which here in Russia, even in normal times, cost practically twice what they do in the United States.

EFFECT OF WAR ON RUBBER FACTORIES.

Prior to the war our two largest rubber manufacturing companies, the Russian-American India Rubber Co., "Treugolnik,"

Petrograd, and the Russian-French India Rubber, Gutta Percha and Telegraph Works, "Prowodnik," Riga, as well as most of our smaller rubber manufacturing concerns were in the hands of Germans. The management was German, and Germans were at the head of the different departments.

When war came all these foreigners had to be eliminated and Russians found to fill the vacancies. This alone amounted to almost total reorganization. After our troops had evacuated Warsaw, the German armies pushed forward into Courland and threatened Riga so that the vast supplies of material, machinery and finished goods of the great Prowodnik works had to be removed to the neighborhood of Moscow. The magnitude of this operation will be realized when it is known that the Prowodnik works employed more than 18,000 hands and required 20,000 horsepower.

The class of labor at the Riga works was what is known here as Baltic labor, composed of Russians, Finns, Hebrews, Scandinavians, Germans and Poles. The war made it necessary to reorganize and new help had to be recruited and instructed. This was successfully accomplished with practically no interruption in manufacturing operations. Prowodnik has materially increased its capital, has practically joined hands with Treugolnik and has opened large offices and salesrooms in Moscow and in Petrograd.

Our leading rubber manufacturing companies are tremendously wealthy and had large quantities of crude rubber and other raw materials on hand when the war broke out. Before Turkey joined in the struggle much raw material was imported by way of the Black Sea, but since the Bosphorus was closed most of our supplies have come via Vladivostok and by way of Archangel. These imports via Vladivostok alone amounted to 112,000 pools [4,044,633 pounds] during the first six months of 1915, so we have experienced no shortage of crude rubber.

Our large rubber factories have been able to maintain their enormous production. During 1914, in spite of war conditions which affected the latter portion of the year, Russia exported \$1,196,000 of rubber footwear and \$1,466,000 of other rubber goods. We are able to produce both solid and pneumatic tires in quantities sufficient for all our needs: the tires we have been importing are mostly of American measurements for the equipment of the motor vehicles we purchased in quantities from America after the war started.

RUBBER FOOTWEAR REPAIR SHOES.

The high cost of our rubber footwear and the natural frugality of our people has created in this country a trade unknown in America, the repairing of rubber boots and shoes. In all our cities, towns and villages there are shops where "rubbers" are repaired "while you wait." These shoe menders state that the public now discards "rubbers" which in normal times they would have repaired.

RUBBER STATISTICS.

Statistics for 1914, recently published, show that our imports of crude rubber and gutta percha amounted in value to \$14,807,000, of which \$6,881,000 were imported from Great Britain, \$3,182,000 from Germany, \$797,000 from the United States, \$560,000 from the Netherlands and \$164,000 from France. During the same period our imports of manufactured rubber and gutta percha only amounted to \$714,000.

RUBBER SCRAP.

Comparatively speaking, very little rubber scrap is reclaimed here. Our leading companies can handle little more than 200 tons per day. Practically all of the rubber scrap produced is collected for export to England, the United States and Germany. Exports to the United States alone, averaged 6,235,916 pounds in weight and \$492,425 in value per annum during the last three normal years previous to the war. This consisted chiefly in

worn-out rubber footwear and thousands of men, women and children found a livelihood in collecting, sorting and packing rubber scrap. Under present conditions this industry is practically dead.

The total exports for 1914 amounted to only \$73,000. This state of affairs is due to the lack of transportation, the practical impossibility of export trade due to high freight rates, and to the lack of sufficient demand for rubber waste. It is also due to the fact that other fields are far more remunerative at present. For example, much of the unskilled labor employed formerly at gathering and preparing rubber scrap, is now chopping and selling fire wood and earning almost five times as much as formerly. Enormous quantities of rubber scrap are accumulating throughout the country.

THE RUBBER TRADE IN GREAT BRITAIN.

by Our Regular Correspondent.

MANUFACTURERS in nearly all branches of the trade report being extremely busy, many of the larger works continuing to be mainly engaged upon governmental work. Two of the largest plants in the Manchester district have recently been added to the list of factories "controlled" by the Ministry of Munitions, which means, *inter alia*, that their profits are limited to 20 per cent above their normal pre-war profits.

The position with regard to the raw rubber market is more tranquil than in the immediate past, it being generally recognized that there is sufficient rubber for all likely demands.

The rush up to the dollar line occurred without any good reason, a fictitious market being created owing to the fact that both Russia and the United States were large buyers at the same time. The freight question of course remains, and will continue to influence the market, though too much has been made in some quarters of the diversion of the traffic from the Suez Canal to the Cape route, which only takes seven or eight days longer. Manufacturers generally are looking forward to rubber at 2s. 6d. or 3s. per pound.

Busy as rubber manufacturers are, they have plenty of worries to contend with, such as shortage of labor, high prices of chemicals, internal transit difficulties, etc. Women are being increasingly employed in place of men, and with quite satisfactory results.

THE EDITOR.

The modest announcement in the January INDIA RUBBER WORLD of the election of Henry C. Pearson as a Fellow of the Royal Geographical Society of London came as an interesting and appreciative item of news to British readers, to many of whom Mr. Pearson is personally known. It has been said of some of the Fellows that they have obtained their entry to the society too easily; in other words, that the amount or the nature of the ground they have covered has been too limited. No objection of this sort can be justly made in the present case by those who know Mr. Pearson's wanderings in rubber producing regions.

SIR CLEMENTS R. MARKHAM

The society has come into prominence lately by reason of the death of one of its oldest and most prominent fellows. I refer of course to Sir Clements R. Markham. By the way, in the various obituary notices which I have read I have not seen any reference to his journey to Panama in company with Robert Cross, of Liverpool, to obtain seeds and cuttings of the *Castilloa* tree. No doubt this was not of as much importance as the guine business, but the ultimate outcome of this journey has proved by no means of an insignificant nature.*

*It was our belief that, while Sir Clements R. Markham was the active head of the Panama expedition, he did not go with it, but as Mr. Cross, THE EDITOR.

RUBBER COLLARS

I have never worn a rubber or celluloid collar, though they have long had admirers. One of the numerous changes of procedure which the war has brought about is the greater use of these collars, mainly by the better class of workmen, and sales have been very brisk. This is not attributable to the higher cost of linen collars because these, if anything, have been cheaper, owing to the number of men wearing khaki collars. The cause is due rather to the increase in laundry charges, which have shown a substantial rise.

WRINGER ROLLS

Specializing in the rubber industry has long been a feature of American practice, while in Great Britain it has been customary for factories to make a wide range of goods. Wringer rolls for domestic washing machines were at one time largely imported from America, and for all I know this may be the case today. There is now, however, a small rubber works, the Acme Rubber Co., situated in a suburb of Glasgow, where these goods are the sole product. It has by no means a monopoly of this business as many of our large works also make these goods. I mention the case as an interesting example of specialization—a procedure which is uncommon with us.

REMOVAL OF WORKS.

Some months ago I mentioned that the Burnett Motor Tire & Rubber Co. had commenced manufacturing at the Limpley Stoke Works, formerly occupied by Wallington, Weston & Co., Limited. The premises, being too small, the Burnett company has removed a few miles to larger works at Trowbridge.

LETTER FROM FRANCE.

By Our Regular Correspondent.

UNDER war conditions solid rubber tires have not been averaging better than from 1,500 to 2,000 miles, less than one-tenth of what is expected from them in commercial use. These low war mileages have been attributed to bad roads, overloading, over-speeding, constant exposure to the elements and to lack of proper attention. Some trouble is being experienced with quality which is far below the average peace time standard. This condition is not due to lack of crude rubber, for we have more than we can use, but to lack of skilled labor which for a time was scarcely felt.

From a mechanical point of view trucks in our army use are in much better condition than is usual in commercial service. Wheels out of parallel which grind the life out of tires and which are fairly common in commercial trucks are rare. One feature of war service that certainly helps to explain low mileages is that trucks are constantly under heavy loads. Temporary shortage of correct sizes and the necessity of keeping trucks in constant service have often led to the use of too small tires.

Interesting results have been obtained by using oversize tires; 110 millimeter (4½-inch) tires have in many instances outlasted two sets of 90 and 100 millimeter (3½ and 4-inch) tires for identical service.

In spite of many difficulties French tire manufacturers have been well able to supply all demands. Rubber has always been plentiful, but certain other raw materials have often been scarce.

In the early months of the war numerous American trucks were imported with American tires and American rim sizes. Our army has been altering these inch-size rims so that they can receive standard French-made tires. All new American trucks now coming into the country are built to receive French tire sizes.

The Société Française B. F. Goodrich is the only American tire concern with a plant in France, but the United States Tire Co. has for some time had a representative studying conditions here. The Goodrich plant near Paris manufactures both solid and pneumatic tires and inner tubes and also imports finished tires. The French customs-duty makes the profitable sale of American

tires difficult. While American demountable solid rubber tires have been received here with little confidence, they have developed no serious troubles.

GENERAL NOTES.

The "Bulletin du Caoutchouc," the only rubber plantation financial paper published in France, recently resumed publication. This journal, which was founded five years ago, is devoted exclusively to the promotion of Malaya rubber plantation shares. Writing on exchange this paper states that rubber plantations cause 400,000 francs [\$77,200] of gold to come each month into France. In this manner rubber plantations indirectly do their share in improving the rates of exchange.

The Société Industrielle des Téléphones, which owns and operates several large cable and general rubber goods factories in this country, recently held its annual meeting of shareholders. The report submitted for the fiscal year 1914-15 showed that, after deducting all costs, including 350,000 francs [\$67,550] distributed among the families and dependents of employees now under arms, the net profits to be distributed among shareholders amounted to 1,800,155 francs [\$347,430].

The city of Lyons, which in France is second only to Paris in population, is organizing sample fairs to occur each year during the first fortnight of March. As indicated, these fairs will be strictly for showing samples and taking orders for future delivery. It is hoped to restore to Lyons the immense trade that was done there at fairs held in the Middle Ages. It is announced that a number of French, Swiss, Italian and British rubber firms will be represented.

New patent legislation here gives power to the Ministers of War and Marine to exploit, either in State or private factories, inventions of interest to our army and navy which are patented or deposited for patent. French subjects or foreigners domiciled in France are prohibited from applying abroad for patents referring to inventions of interest to any branch of our military services.

EUROPEAN TRADE NOTES.

SWITZERLAND.

Heinrich Stadelmann has started to manufacture rubber elastic fabric in Egg.

DENMARK.

The firm of Augustinus and Hansen, commission agents in waterproof garments, 29-31, Pilestrade, Copenhagen, was recently incorporated under the name of Augustinus and Hansen A. G., to manufacture rainproof garments. The directors are Ejnar Hansen and Kay Heiberg-Jürgensen. The stock capital, fully paid, is 50,000 crowns (\$13,400).

Vald. Foersom has taken over the business of Fritz Christensen, at 27, Amagertor, Copenhagen, and will deal in rubber footwear and general rubber goods.

According to the "Kraks Vejviser 1916," a directory published in Copenhagen, the following wholesale rubber goods concerns were organized in Copenhagen during 1915:

A. Alexander, Vester Boulevard 36.
A. Dahl & Nielsen, Aktieselskab, Kjöbmagergade 63-65. Capital stock 200,000 crowns (\$53,600).

Max Möller, Havnegade 55 (mechanical rubber goods, packings and asbestos goods).

Hjalmar Maag, Kjöbmagergade 9 (general agents and dealers in surgical instruments and fittings).

SWEDEN.

The Boras Band och Hängslefabriks Aktiebolag, Boras, manufacturer of rubber bands and garters, reports 300,000 crowns [\$80,400] profits earned during the year 1914-1915, and an 8 per cent dividend.

Aktiebolaget P. Ericsson & Co., Gothenburg, manufacturers of waterproof tents, covers and the like, have paid a dividend of

12 per cent out of 400,000 crowns [\$107,200] profits earned during the year 1914-1915.

The firm of Alfred Lindahls Import Aktiebolag, Vastergatan 33, Malmö, importer, manufacturer and dealer in rubber and rubber proofed garments has divided 102,000 crowns [\$27,336] profits among its shareholders which amounts to a dividend of 7 per cent.

Aktiebolaget Birlinger is the name of a new 50,000 crown [\$13,400] company recently incorporated in Stockholm to deal in automobile tires and accessories.

Herman Kunze, founder of Herman Kunze's Maskinförordenhetsaffär, 5 Hamngatan, Gothenburg, wholesale dealers in asbestos goods, belts, packings and general rubber mechanical goods, has been elected to the first chamber of the Swedish parliament.

Stockholms Gummifabrik has been organized in Stockholm by Paul A. Person.

THE RUBBER SITUATION IN THE GUIANAS.

By a Resident Correspondent.

MISLEADING statements have been made concerning *Hevea* diseases here which I am glad to say have been disproved in many quarters in these colonies. If these statements were left uncontradicted the rubber industry in the Guianas would have suffered materially.

The Governor of British Guiana at a meeting held on December 2, 1915, said:

There is no reason to fear that the diseases now prevalent in some districts will prove more formidable than others which have been successfully fought and conquered here and elsewhere. The Director of Science and Agriculture has informed me he is certain C. K. Bancroft, M.A., F.L.S., the government botanist, can tackle it successfully.

The disease must be fought. In Dutch Guiana every effort is being spent in stamping it out. Efforts must be made to conquer it at its first appearance. All the rubber growers in British Guiana are advised the moment they suspect the presence of this or any other disease to get at once into communication with the Department of Agriculture.

At one time the tendency existed, if any planter was under the impression that his cultivation was being attacked by disease, to keep the matter as quiet as possible and avoid communication with the responsible authorities. Disease was looked upon as something that was bound to come but would in the course of time disappear. We now know that whenever a large number of plants of the same species are brought together by artificial means, it is almost a certainty that disease of some kind will creep in. A plant under plantation conditions foreign to its natural habits, is particularly liable to disease. What is not so clearly recognized by the planter is that if disease is to be successfully fought it must be tackled at once. If the planters delay adopting remedial and preventive methods, should the conditions happen to be favorable to the development of any particular disease, that disease will surely spread, or it will take so firm a grip upon his plantation that the expense of eradicating it may possibly cause his ruin.

So, too, with this leaf disease of Para rubber, said to be prevalent on certain plantations in the Guianas. Immediately it appears steps should be taken to combat with it. In all probability it may prove a disease of no great danger, but on the other hand sufficient is known of it to conclude that it can, under certain conditions, prove a grave menace to the rubber planter.

We in the Guianas, so far as we can learn, do not suffer from root disease of *Hevea*, which causes so much anxiety in the East. Hence, if our plantations are free from *Fomes semitostus* we should be all the more prepared to get rid of a leaf disease

which is so obviously more easily detected and treated than a root disease.

An example of the damage that can be done by certain diseases is seen in the witchbroom disease of cacao. This disease, where conditions are favorable, can and does prove most disastrous. The cacao industry of Dutch Guiana was practically ruined by the witchbroom disease, and in British Guiana the planter here and there were also victims to this terrible plague. The coffee industry of Ceylon was ruined many years ago by disease which would probably in these days have been tackled and the industry saved.

From exhaustive investigations in the Guianas, it has been discovered that the soil in neither of the colonies is responsible for the leaf disease. The Department of Agriculture at Dutch Guiana is at present very busy with its examinations, and it is expected by the middle of 1916 its report will appear before the world.

In British Guiana, 1,932 pounds of rubber were exported in 1914-15 as against 1,292 pounds exported in 1913-14, an increase of 640 pounds. Of this amount 380 pounds was collected from crown lands and paid royalty, the rest was from private properties.

The rubber cultivation on leased crown lands at the Hills Estate, right bank of the Mazaruni river, and of the Consolidated Rubber and Balata Estates, Limited, at Alik, right bank of the Essequibo river, have been maintained. Cultivation of rubber has been commenced by the latter company on 43 acres of the recently leased land, Koriabo, on the left bank of the Aruka river, North West district, adjoining the Government Experimental Station at Issorora, the rubber being interplanted with catch crops.

The tapping of rubber trees was carried out at the Government Experimental Station at Christianburg and Issorora, and at the David Young's property, Aruka, now owned by the Consolidated Rubber & Balata Estates, Limited, and excellent biscuits obtained from the latex.

A showcase owned by the Permanent Exhibitions Committee of the Board of Science and Agriculture and containing samples of rubber and balata, has been placed in the Museum buildings, with the consent of the directors of the Royal Agriculture and Commercial Society.

The cultivation of rubber on the sugar estates in Demerara and other freehold properties in that colony have been maintained, and the production from such sources ought soon to be apparent.

The estimated area under rubber cultivation in the whole colony of British Guiana, according to the reports from the Department of Lands and Mines, on March 31, 1915, was 4,962 acres.

The low price of rubber has had the effect of diverting attention from the cultivation of this product, and there has been no large increase in area cultivated, but it is possible that interest may be revived after the war, when an improvement in the market is looked for.

In Dutch Guiana, the industry during 1915 cannot be said to have suffered any material loss. The trees on most of the estates are all nearly ready for tapping and, had it not been for the war in Europe, many planters would have reported good shipments. It would seem, however, that the trouble in Europe is a blessing in disguise for the industry in the Dutch colony for, after the war, prices are expected to be high. The estates will be then in a better position to profit by the long cessation from tapping and the trees will, it is hoped, be entirely freed from the leaf trouble.

It is unfortunate, however, for Dutch Guiana, that the Holland element introduced from the East Indies to fill responsible positions are men of very little feeling for the country. A recent importation, who arrived a few weeks back to report on a rubber estate, has discovered already that Dutch Guiana is unsuited for rubber and that the Far East is ideal. I could quote instances

where these East Indian experts are prejudiced against the country long before they set foot on the soil.

The balata industry in the Guianas suffered considerably during 1915 and bleeding operations were practically suspended. In British Guiana, however, the royalty collected on this product during the year was \$24,946.35, as against \$29,590.86, or a decrease of \$4,644.51. Notwithstanding the adverse conditions in that colony caused on account of the war, the production was very satisfactory and had the war not occurred, the year would have bid fair to have been a record one.

The following are the companies that carried on operations during the year with the quantity of balata on which royalty was paid by each:

Consolidated Rubber & Balata Estates, Limited.....	pounds	788,061 1/4
Garnett & Co., Limited.....		143,286
Thorn & Cameron, Limited.....		73,614
M. Doyle & Co.....		65,721
British Guiana Balata Co., Limited.....		26,271
H. L. Rongelron.....		14,554
C. A. Barrett.....		13,121
Edward Maier.....		9,191
Evan Wong.....		8,536
P. E. Smith.....		2,654
W. H. Patator.....		-2,665

Total.....1,148,734 1/4

It will be seen that the chief operators were the Consolidated Rubber & Balata Estates, Limited, whose holdings represent the tracts formerly owned by Garnetts, McKinnon, Downer, Davson—chief balata pioneers of the past. Four new balata collecting licenses were issued and 65 licenses canceled for failure to pay the rentals due thereon, leaving 678 in existence at the close of the year.

The bleeding of balata by Indians on the reservations was continued from April to October, 1914, when the issue of permits was discontinued owing to the difficulty in disposing of the substance on account of the war. There was, notwithstanding, collected by the Indians from the Berbice and Pomeroy reservations, 19,559 pounds of balata which produced in revenue to the government \$1,955.90.

Dutch Guiana's balata crop began in May, 1915, owing to the new regulations which upset the entire machinery of the industry, but fortunately an order to cancel the laws reached the colony just in time to avert a crisis. However, from May to December 31, 1915, the colony produced 564,380 kilograms [1,128,760 pounds].

The war severely hampers the industry, as it is not possible to export balata to Europe and, there is no demand from the United States; if, however, the prices were attractive, good business could be effected by sending the bulk of balata produced in the Guianas to the United States.

French Guiana produced a fairly large crop during 1915, but no figures have yet come to hand. Very much activity, however, is displayed by the French people and there is a great rush for the balata forests on the Maroni, where very extensive tracts are untouched, especially on the Mini and Spinning creeks, where the trees are within easy reach from the landing places.

GERMAN IMPORTS AND EXPORTS OF WASTE.

Under paragraph 98d of the German tariff, rubber waste is included with gutta percha and balata waste. The latest available statistics of this trade, which are for the year 1913, are reprinted from the "Gummi-Zeitung," which says that no statistics have been given out since the beginning of the war.

GERMAN IMPORTS AND EXPORTS.

	IMPORTS.	EXPORTS.
Belgium.....	pounds 407,000	306,460
France.....	1,236,180	298,540
Great Britain.....	1,361,200	4,217,400
Holland.....	319,220	443,960
Austria-Hungary.....	1,406,020	446,600
Russia.....	490,600	187,000
Sweden.....	239,020	
United States.....	603,460	2,508,000
Other countries.....	1,443,320	173,140
Totals.....	8,006,020	8,581,100
Total Values.....	\$69,502	\$658,308

Rubber Planting Notes.

RUBBER TAPPING IN SOUTH KURG, INDIA.

CONSIDERABLE falling off in the yield of latex from the Ceara rubber trees has been noted in South Kurg, India, during the prevalence of overcast wet weather. Better yields are obtained when the nights are clear and dewy, provided there be no wind to dry up the latex in the cuts and stop its flow. The latex that is thus dried in the wounds is sometimes collected as scrap rubber, other times it is left to assist bark renewal. Vertical tapping is most easily performed by the coolies, who are expected to bring in 60 to 80 ounces of latex a day. It takes less time and they can attend to a greater number of trees than with the herring-bone or half herring-bone systems, but the most economical method has to be determined by the quantity of latex the trees yield under each system.

The vertical system consists in cutting a vertical channel from a height of about 6 feet to within 6 inches of the ground and then paring off one side of this channel. It has been found impracticable to tap during the southwest monsoon so that, allowing for one inch in breadth of the surface to be pared away in a month, three inches breadth is necessary for the three months season during which Ceara is tapped. Tapping can be continued for an extra month in May, after the growth of new leaves, but the best yields are always obtained during November, December and January.

If the consumption of bark surface is 6 feet by 3 inches a season, it will allow only two wounds being made in a tree 36 inches in circumference, one on each half of the tree a season, as the tapping must be arranged so that the newest bark will not be cut until it is three years old.

Paring of the bark on each side of the vertical channel is not advisable because it leaves too large a wound.

Another method of vertical tapping is to leave strips of cortex between the cuts in order to assist in bark renewal. The advantage of this system is that the guards of the tapping knives can be set so as to guard against injury to the cambium. Where strips of bark are left between the cuts, the guard of the tapping knife moves over the hard upper rind in advance of the cutting blade. If this guard has been properly set the cambium can not be touched. A tapped surface never recovers the smoothness of the original bark except when new layers of wood and bark grow in from the sides over bad wounds.

The best yields have so far been obtained from full herring-bone tapping, but the drawback is that half of the tappable surface has to be worked on each season and the Ceara tree is too delicate to stand such treatment. Experts are of the opinion that coolies should not be ordered to bring in a fixed quantity of latex daily, as they are likely to be led to make too deep cuts thus damaging the trees. Daily tapplings are preferable for Ceara to tapping on alternate days.

FRENCH AFRICAN RUBBER.

Writing on the subject of commercial relations between French Equatorial Africa and the Russian Empire the "Petit Bulletin de l'Office Colonial," published in Bordeaux, France, states that rubber is probably the only product of this French colony that possibly could be sold in almost unlimited quantities in Russia. Up to the outbreak of the war, this trade was monopolized by German traders and brokers who imported the rubber, mixed it with other qualities, and resold it to the Russian manufacturers. The purchasers were thus unable to appreciate the qualities of "nerve," elasticity and strength of the French African wild rubber.

YIELDS OF RUBBER PER ACRE.

Occasional references to exceptionally heavy yields of rubber per acre by plantation companies tend to cause the fact to be overlooked that the average production of the whole planted area of any given estate is on quite a moderate scale, says the London "Financial Times." Some interest was aroused a few years ago by a yield of 1,300 pounds per acre on a small part of one estate, but this excessive output was followed by a drop in the following year. Even the giant producers do not as a rule average 300 pounds per acre over the whole planted area, although this is generally explained by the inclusion of large areas not in bearing.

Anglo Malay reached 345 pounds per acre over the whole planted portion last year, Batu Caves 356 pounds and Batu Tiga 367 pounds per acre, and others which exceed the 300 pounds limit include Ulu Rantau, Tremelbye, Sungei Salak, Sungei Buloh, Seafeld, Rubber Estates of Johore, Perak, Pataling, London Asiatic, Kurau, Kuala Selangor, Kamuning and Chersonese.

The following table shows the yield per acre of a number of companies whose reports have recently appeared:

POUNDS PER PLANTED ACRE.

	1914.	1915.
Braunton	162	214
Swillinghall	73	132
Langen (Java)	154	223
Lumut	173	226
Ratoni	235	251
Senlayan	194	243
Tanjung	186	249
United Serdang	190	257

The above list may be regarded as a representative selection of good class companies. It will be seen that on the basis of a yield in full bearing of 400 pounds to 500 pounds per acre there exists plenty of scope for increase from the present planted acreage.

ILKEN-DOWN LATEX COAGULATING METHOD.

The acetic acid and similar methods of coagulating rubber latex have long been the accepted process in the Far East, therefore a new method, recently patented, is interesting. A. C. Ilken and St. V. B. Down are the inventors.

The apparatus consists of a circular zinc latex tank provided with a cover and stirring device. An injector with a 1/32-inch opening is fitted to the bottom of the tank, and connected by a rubber tube with another tank that contains benzene and methylated spirit—the precipitating mixture.

The latex is first measured, and then put in the tank and stirred. When it commences to thicken the precipitating mixture is forced into the tank by a foot pump, stirring being continued in the meantime. The coagulum forms rapidly, and after a short interval it is removed from the tank and creped.

FLOODS AND LANDSLIDES IN JAVA.

Some anxiety was recently caused among those interested in Java rubber plantations by news from Batavia of landslides and floods. The opinion is expressed in the London rubber share market that the disaster will not affect the rubber planting industry as most of the rubber estates are remote from the scene of the inundations.

VODKA SYNTHETIC RUBBER AND THE CEYLON PLANTERS.

The story that the Russian Government was going to use its vast stock of vodka for making synthetic rubber created no more than passing comment in Ceylon. The rubber planters still remember artichoke rubber and other vague synthetic rubber announcements and require something more definite to make them believe that synthetic rubber manufacturing had been established on a commercial basis.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED JANUARY 25, 1916.

- N** 1,169,123. Combination hot water bottle and ice bag. M. E. Burns, Chicago, Ill.
- 1,169,118. Solid tire. W. W. Wildman and E. A. Tinsman, assignors to The Portage Rubber Co.—all of Barberton, Ohio.
- 1,169,277. Tire valve. J. N. Newsom, assignor to W. H. Morgens—both of St. Louis, Mo.
- 1,169,301. Valveless atomizer. S. Trask, San Francisco, Cal.
- 1,169,324. Horseshoe pad. C. W. Dunning, Los Angeles, Cal.
- 1,169,361. Inflatable floating device for flying machines. P. Siptrott, Brooklyn, N. Y.
- 1,169,380. Self-adjusting ball conformer with elastic tube and cord. L. Cohen, St. Louis, Mo.
- 1,169,389. Hose coupling. H. Forsman, Fresno, Cal.
- 1,169,455. Supporter comprising an elastic belt. C. F. Bennett, assignor to Sharp & Smith—both of Chicago, Ill.
- 1,169,459. Air brake coupling with electrical conductor. A. J. Campbell, Marion, Ia.
- 1,169,500. Child's garment with elastic garters. N. C. Leavitt, Newark, N. J., and I. Mink, Brooklyn, N. Y., said Mink assignor to said Leavitt.
- 1,169,524. Hose sprayer. L. S. Baker, Pasadena, Cal.
- 1,169,525. Antiskidding device. M. P. Bixby and F. C. Renner—both of Great Falls, Mont.
- 1,169,562. Rubber overshoe with elastic retaining toe band. F. W. Ostrom, Newark, N. J.
- 1,169,575. Wheel tread comprising a body of resilient material, W. Seidel, Chicago, Ill.
- 1,169,585. Billiard table cushion rail and rubber cushion. M. J. Whelan, Muskegon, Mich., assignor to The Brunswick-Balke-Collender Co., Chicago, Ill.
- 1,169,603. Self-filling fountain pen with soft rubber tube. D. W. Beaumel, Brooklyn, N. Y.
- 1,169,712. Lathering device with a rubber bulb. G. Zingali, Montclair, N. J.
- 1,169,746. Sectional tire. C. F. Lighthouse, New York City, assignor to Lighthouse Tire Co., Guttenberg, N. J.
- 1,169,757. Hose supporter. I. G. Allen, Racine, Wis.
- 1,169,804. Toy balloon. T. M. Gregory, Akron, Ohio.
- 1,169,888. Waterproof cover or shield for cycles. J. S. Tulloch, Cashmere, Christchurch, New Zealand.
- 1,169,908. Rim, with pneumatic tire carrying ring. H. J. Arend, Quincy, Ill.
- 1,169,918. Inner tube testing device. B. S. Bowers, Laprairie, Minn., assignor to J. Cloz, St. Ansgar, Ia.
- 1,169,964. Inner tube protector. W. N. Kelley and J. C. Porter—both of Pittsburgh, Pa.
- 1,169,984. Elastic wheel with solid tire. M. Mettler, Leipzig, Germany.
- 1,170,173. Hose rack. C. O. Lund, Brooklyn, N. Y., assignor of one-half to Carlund Manufacturing Co., New York, N. Y., and one-half to W. D. Allen Manufacturing Co., Chicago, Ill.
- 1,170,185. Rubber covered button for hose supporters. V. Price, New York, and J. H. Sanderson, Brooklyn, assignors to C. J. Higley, New York—all in New York.
- 1,170,220. Rubber eraser. J. A. Coyle, Baltimore, Md.
- 1,170,222. A package of elastic garter. J. P. Croasdale, Bayview, assignor to Pioneer Suspender Co., Philadelphia—both in Pennsylvania.
- 1,170,354. Nipple for nursing bottles. J. Skydel, New York City.
- 1,170,412. Valve for tires. W. A. Campbell, Maricopa, Cal.
- 1,170,427. A chain for a tire guard. A. E. Chernaek, Providence, R. I.
- 1,170,497. Solid tire tread. W. T. Bogan, assignor of one-half to W. W. Porter—both of Philadelphia, Pa.

ISSUED FEBRUARY 8, 1916.

- 1,170,597. Pneumatic cord tire. C. L. Archer, Council Bluffs, Iowa.
- 1,170,695. Demountable rim band. H. A. Soulis, assignor of one-half to W. T. Soulis—both of New York City.
- 1,170,781. Elastic garter. H. E. Penn, assignor to Penn Brothers Suspender Co., Inc.—both of Madison, N. C.
- 1,170,825. Fountain pen with rubber ink sac. J. A. Kraker, assignor to Kraker Pen Co.—both of Kansas City, Mo.
- 1,170,828. Game apparatus operated by elastic cord. S. R. Lamb, New York City.
- 1,170,875. Hose supporter with elastic webbing. S. Boyer, New York City.
- 1,170,923. Fountain shaving brush with rubber bulb. C. Malkin, San Francisco, Calif.
- 1,170,937. Automobile wheel having an alternating elastic and non-elastic block tire. E. H. Rundel, Longmont, Colo.
- 1,170,957. A tubular metal tire with rubber tread. A. B. Burt, San Francisco, Calif.
- 1,171,090. Stuffing box packing. G. H. Cook, Poplar, London, England.
- 1,171,147. Tire valve. M. C. Schweinert, West Hoboken, N. J.

- 1,171,144. Spring tire with rubber tread. H. M. Lambert, assignor to Lambert Multiplus Co.—both of Portland, Ore.
- 1,171,238. Football cover. G. L. Pierce, Brooklyn, N. Y., assignor to A. G. Spaulding & Bros. Manufacturing Co., Jersey City, N. J.
- 1,171,447. Rubber thread or cord. H. K. Raymond, Akron, Ohio, assignor to The F. Goodrich Co., New York City.
- 1,171,573. Demountable rim. P. S. Whiting, Akron, Ohio, assignor to M. E. Whiting, Wayne county, Mich.

THE DOMINION OF CANADA.

ISSUED NOVEMBER 30, 1915.

- 165,268. Combination pneumatic and solid tire. T. A. Hall, Bethlehem, Pa., and C. G. O. Hall, Cleveland, Ohio.
- 165,809. Wrapper for tire casings. E. Hopkinson, New York City.
- 165,819. Rubber footwear holder. A. G. Moore, Pownall, Prince Edward Island, Canada.
- 165,861. Rubber sole. United States Rubber Co., assignee of F. Boyle—both of New York City.
- 165,868. Rubber heel. Goodyear Tire & Rubber Co., assignee of I. R. Bailey—both of Akron, Ohio.
- 165,917. Rubber-soled boot or shoe. G. F. Butterfield, West Newton, Mass.
- 165,974. Rubber heel. A. C. Rightor, Pittsburgh, Pa.
- 165,979. Demountable rim. S. E. Siggekow, Marbury, Ala.
- 166,021. Demountable rim. The Standard Welding Co., assignee of R. S. Bryant—both of Cleveland, Ohio.
- 166,119. Rubber boot. The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, assignee of A. H. Streen and H. McNulty—both of Berlin, Ontario—all in Canada.
- 166,249. Pneumatic tire. The American Tire Co., assignee of M. A. Dees—both of St. Louis, Miss.
- 166,270. Solid tire. The Gutta Percha & Rubber Co., Ltd., assignee of J. H. Coffey, and J. H. Coffey, Jr.—all of Toronto, Ontario, Canada.
- 166,281. Inner tube for pneumatic tires. The Reinforced Inner Tube Co., assignee of J. H. Poole—both of Brockton, Mass.
- 166,333. Armored pneumatic tire. R. W. Davis, Philadelphia, Pa.
- 166,381. Puncture proof pneumatic tire. J. A. Shearer, Methuen street, Prospect, South Australia.
- 166,384. Pneumatic tire casing with a layer of compressed cotton. C. V. Roberts, Ocala, Florida.
- 166,391. Pneumatic tire protector. A. F. Tiedge, Bay Bridge, Ohio.
- 166,393. Tire with elastic cushion. P. C. Traver, Far Rockaway, N. Y.

THE UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent upon the filing of the application.

*Denotes Patents for American Inventions.

- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JANUARY 12, 1916.]
- 19,821 (1914). Method of detachably securing heels and soles. A. E. Layton, Mill House, Winterton, Norfolk.
- 19,888 (1914). Non-slip plates for dual solid tires. G. H. Green, 25 Ouseley Road, Balham, London.
- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JANUARY 19, 1916.]
- 20,187 (1914). Photographic developing device comprising rubber tubing and bulb. J. A. L. Gimblette, 110 Cambridge Gardens, and G. V. Rowden, 31 Longridge Road both in Kensington, London.
- 20,311 (1914). Rubber ball valve for feeding bottles and invalid cups. W. F. Carr-Hill, 37 Walbrook, London.
- 20,378 (1914). Method of attaching covers to tennis or rubber balls. E. C. Wisden-Luff, and J. Wisden & Co.—both of 23 Cranbourn street, London.
- 27,654 (1914). Tread attachments to rims. C. F. Foster, 235 South Grove avenue, Oak Park, Ill.
- 12,170 (1914). Footballs, etc. J. Nielson, 485 Clarkston Road, Cathcart, Scotland.
- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JANUARY 26, 1916.]
- 20,498 (1914). Block tire. L. Linden, 117 rue Belliard, Brussels.
- 20,519 (1914). Inhaler with rubber buffer. E. A. Mays, 35 Newhall street, Birmingham.
- 20,549 (1914). Lead covered cable. C. J. Beaver, Rangoom, Crescent Road, Hale, and E. A. Claremont, Broom Cottage, High Legh—both in Cheshire.
- 20,570 (1914). Life belt with inflatable bags and elastic bands. W. Portsmouth, Windham House, Windham Place, Southampton.
- 20,630 (1914). Inflatable lifesaving armlet. R. F. Hislop, Greenhill House, Paisley, Renfrewshire.
- 20,659 (1914). Rectangular waterproof sheet for use as a coat, tent or stretcher. E. Terry, 117 Loughborough Park, Brixton, London.
- 20,660 (1914). Boats and toy fishes propelled by rubber cord. H. J. Chart, Weymouth, Carlton Road, Putney, London.
- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, FEBRUARY 9, 1916.]
- 21,035 (1914). Tire valve. R. Walsley, Clyde Road, and G. C. Dagnall, Rushton street—both in Didsbury, Manchester.

- 57,660 (1914). Rubber fabric protector on machine patent leather footwear. J. A. Kelly, 308 North Park avenue, Philadelphia, Pa.
 57,664 (1914). Toy balloons with rubber bladder. I. Berny, 101 Gloucester Place, Portman Square, London.
 57,173 (1914). Pneumatic tire with rubber puncture protector. A. F. Tiedge, Bay Ridge, Ohio.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

- 477,813 (February 3, 1915). Improvements in vehicle wheels. A. Wallace.
 477,837 (June 19, 1914). Improvements in coupling heels for footwear. D. Klein.
 477,617 (December 12, 1914). Fabric composed of thin superposed layers, intersecting one another and joined together by an adhesive substance. L. A. Subers.
 477,647 (February 10, 1915). Pneumatic suspension for automobile bodies. W. G. Wood.
 477,657 (February 11, 1915). Elastic wheel. W. H. Dams and de Lankar series.
 477,666 (February 12, 1915). Elastic wheel. G. F. Pinsuti and Miss Talvard.
 477,669 (February 13, 1915). Improvements in elastic bandages. W. H. Heina.
 477,785 (February 24, 1915). Pneumatic tire with a non-continuous, detachable tread, with or without a metallic armor, and provided with a puncture-proof inner tube. M. J. B. Maubon and F. C. G. Carré.

NEW ZEALAND.

ISSUED DECEMBER 9, 1915.

- 35,742. Milking machine test cup. T. N. Fletcher, Hamilton, New Zealand.
 35,786. Milking machine test cup. A. B. Robertson, Westown, New Plymouth, New Zealand.
 36,406. Pneumatic tire cover. The Asbury Syndicate, Ltd., 8 Laurence Pountney Hill, Cannon street, London, E. C., England.

TRADE-MARKS.

THE UNITED STATES.

ISSUED JANUARY 25, 1916.

- 89,172. Perry-Matcom Co., Haverhill, Mass. The word *Pymal*. For shoes of rubber, etc.
 90,030. The International Rubber Co., Denver, Colo. The words *Half Sole Tire*. For rubber tires.
 90,484. The Miller Rubber Co., Akron, Ohio. The word *Sanitate*. For nipples, non-collapsible.
 91,048. The United States Asphalt Refining Co., New York, N. Y. The word *Rubraze*. For asphalt base filler used for mixing with rubber, etc.
 91,049. The United States Asphalt Refining Co., New York, N. Y. The word *Infusite*. For an asphalt base filler used for insulating wire, etc.
 91,079. National India Rubber Co., Bristol, R. I. The word *Week-End*. For rubber and canvas boots, shoes and slippers.
 91,352. Mishawaka Woollen Manufacturing Co., Mishawaka, Ind. The word *Plato*. For light weight rubber shoes.
 91,436. The B. F. Goodrich Co., New York, N. Y. Illustration of a double circle with the words *Double Duty* in the inner one. For soles composed of rubber and a fibrous filler for boots and shoes.
 91,521. Mishawaka Woollen Manufacturing Co., Mishawaka, Ind. The word *Kalo*. For light weight rubber shoes.
 91,688. Mishawaka Woollen Manufacturing Co., Mishawaka, Ind. The word *Alco*. For light weight rubber shoes.
 91,689. Mishawaka Woollen Manufacturing Co., Mishawaka, Ind. The word *Coro*. For light weight rubber shoes.
 91,727. Mishawaka Woollen Manufacturing Co., Mishawaka, Ind. The word *Beth*. For light weight rubber shoes.
 91,728. Mishawaka Woollen Manufacturing Co., Mishawaka, Ind. The word *Neko*. For light weight rubber shoes.
 91,744. Mishawaka Woollen Manufacturing Co., Mishawaka, Ind. The word *Hera*. For light weight rubber shoes.
 91,745. Mishawaka Woollen Manufacturing Co., Mishawaka, Ind. The word *Inka*. For light weight rubber shoes.
 91,746. Mishawaka Woollen Manufacturing Co., Mishawaka, Ind. The word *Nora*. For light weight rubber shoes.

ISSUED FEBRUARY 1, 1916.

- 89,505. Cappelletti Specialty Co., Weston-Salem, N. C. Portrait of a man with words *Paragon*. For chewing gum.
 90,407. The Firestone Tire & Rubber Co., Akron, Ohio. Illustration of a tire. For rubber tires and casings.
 90,563. Motor Supplies Manufacturing Co., Minneapolis, Minn. The words *Perma Tire Patch*. For tire patches.
 90,618. Samstag & Hilder Bros., New York, N. Y. Illustration of a coat of arms with a shield and a crown with the word *Colonial*. For bathing caps made of rubber alone or rubber and mercerized cotton and silk.

ISSUED FEBRUARY 8, 1916.

- 89,038. Schacht Rubber Manufacturing Co., Huntington, Ind. The word *Daisy*. For sink, bath and basin stoppers, plugs, bumpers, etc.
 89,577. C. L. Coleman, Chicago, Ill. The words *Coleman Street Karamel Ko-Ko-Tulu*. For chewing gum.
 91,100. National India Rubber Co., Bristol, R. I. The word *Week-End*. For boots, shoes and slippers having rubber soles vulcanized to fabric uppers.

- 58,511. Firestone Tire & Rubber Co., Akron, Ohio. The word *Neutrin* in the center of a circle. For soles and heels for boots and shoes formed of an artificial composition.
 58,525. J. W. Glenn, Buffalo, N. Y. Illustration of a woman with the words *Keupie Rose O'Neill*. For chewing gum.
 58,566. I. B. Kleiner Rubber Co., New York City. The word *Paraloid*. For waterproof sheeting for surgical and sanitary use.
 91,068. The Charles William Stores, Inc., Brooklyn, N. Y. Picture of a bridge within a circle with the initials *C. W. S.* (see above advertisement).

DESIGNS.

THE UNITED STATES.

ISSUED FEBRUARY 8, 1916.

- 48,544. Tire. E. F. Lyon, Chicago, Ill.
 48,541. Tire. J. C. McLean, Lakewood, Ohio.
 The Dominion of Canada.
 ISSUED NOVEMBER 30, 1915.
 3,926. Rubber tire. F. D. Law, Toronto, Ont.
 3,932. Automobile tire tread. Gutta Percha & Rubber, Ltd., London, England.

THE RUBBER SCRAP MARKET.

THE sentiment of the rubber scrap market for the month that has just passed has been decidedly bullish. Last month's excitement subsided early in February, but the general situation has remained unchanged and firm throughout and the expected downward trend of prices has not materialized.

Boots and shoes continued to be the leading feature in the market. The extremely inclement weather and consequently slow collections from outlying sources resulted in firm prices. Sales were made to the mills early in the month at 11½ cents delivered but for large quantities, 11¼ to 12 cents was asked. During the last week of the month the market weakened due to the arrival of considerable stocks, and boots and shoes were sold at 10¼ to 11 cents.

The tire situation has been quite uninteresting. Values have remained firm with the same levels as last month; however, during the latter part of the month the market eased off and lower prices were freely predicted. G. and G. white tires were quoted at 8¼ cents; auto tires mixed at 6¼ cents. Inner tubes were selling at 29 to 30 cents in a firm market supported by the strong position of crude rubber. Bicycle tires have shown a slight gain during the month and 4 cents is the present price to the mills.

The balance of the list has recorded slight advances in price since our last market report and actual buying has only been normal in volume. Mechanicals, however, were in good demand at prices that show advances of ¼ to ½ cent a pound.

It is estimated that 183,000 tons of casings and tubes will be scrapped during 1916.

NEW YORK QUOTATIONS FOR CARLOAD LOTS DELIVERED.

FEBRUARY 29, 1916.

Prices subject to change without notice.

	Per P. md.
Boots and shoes	\$8.00 @ .11
Trained shoes	.08 @ .08
White tires, Goodrich and Goodyear	.08 @ .08
Auto tires, standard white	.06 @ .06
standard mixed	.04 @ .04
stripped, unguaranteed	.04 @ .04
Auto peelings, No. 1	.06 @ .10
No. 2	.04 @ .04
Inner tubes, No. 1	.30 @ .30
No. 2	.14 @ .14
Inner tubes, No. 3	.02 @ .02
Inner tubes, No. 4	.02 @ .02
Bicycle tires, No. 1	.04 @ .04
Solid tires, No. 1	.04 @ .04
White scrap, No. 1	.06 @ .06
No. 2	.04 @ .04
Red scrap, No. 1	.06 @ .11
No. 2	.04 @ .08
Mixed black scrap, No. 1	.04 @ .04
No. 2	.04 @ .04
Rubber car springs	.04 @ .04
Horse shoe pads	.04 @ .04
Mattings and packings	.04 @ .04
Garden hose	.06 @ .02
Air brake hose	.06 @ .06
Cotton fire hose	.04 @ .04
Large hose	.04 @ .04
Hard rubber goods, No. 1, lightest	.04 @ .04
Batteries, various sized compounds	.04 @ .04
Insulated wire stripping	.04 @ .04
Rubber goods	.04 @ .04

Review of the Crude Rubber Market.

NEW YORK.

It was freely predicted early in the month that February would very likely be a period of comparative quiet in trading and that lower prices would rule. With the exception of values, however, the above forecast has been fairly well supported by the market conditions that have prevailed during the past month.

On February 1, First latex and Smoked sheet nearby, were quoted at 76 cents, with very little difference in prices for future deliveries of these sorts. Upriver fine was selling for 73 cents.

The generally quiet tone that has dominated the market during the month would justify the belief that the manufacturers had already bought heavily during the recent period of high prices. The small orders that had been placed this month by the large consumers would indicate an interest only in immediate requirements.

Forward deliveries were very uncertain due to the lack of cargo space and shipments from the Far East were very slow—90 days is not unusual when shipments are routed via Cape of Good Hope.

Values, however, have ranged upward, and strongly reflect the firm market that has generally prevailed in London. Prices continued to advance steadily and on February 18, First latex, nearby, was quoted at 91 cents. Smoked sheet, prompt shipment, was 89 cents and Upriver fine, nearby, was firm at 77 cents. Then the market developed an easier tendency and prices declined due to lack of local support and heavy arrivals from London.

The last week of the month witnessed considerable activity in Beaver street and prices again advanced. This condition is evidently due to the scarcity of rubber in the primary markets and the steady demand from the consuming interests. On February 29, First latex, spot was quoted at 93 to 94 cents and Upriver fine, 77 to 78 cents.

The arrivals at the port of New York for the first 17 days of February total 5,000 tons in round numbers. Plantation imports head the list, with 2,200 tons from London and Liverpool and 1,200 tons from Colombo and Singapore. Other imports were, 23 tons Para rubber from London and Liverpool; 84 tons Para from Para and Manaos; 110 tons, Centrals; 87 tons Plantation, from Rotterdam; 540 tons, Africans; 1500 pounds Plantation from Paramaribo, Dutch Guiana.

There is every indication that the New York imports for February, 1916, will fall short of 9,400 tons, the figures for January—the largest monthly receipts since March and April, 1915, when 10,500 tons and 10,150 tons, respectively, were imported.

LONDON.

This market has been well supported at critical periods during the past month and prices in all positions have recorded steady advances. This firmness of the market is due in part to American requirements and the recent heavy buying orders from Russian sources. These movements have had a steadying effect on values at this time when large stocks are accumulating and arrivals are congesting the docks at Liverpool and London.

An unusual circumstance was noted during the past month in that futures were at a premium over spot rubber.

That sufficient rubber is being produced to meet the world's requirements is not doubted. That rubber prices should be normal is theoretically true. But, the fundamental difficulty that constantly threatens the rubber market is the question of shipping.

PARA AND MANAOS.

There has not been much demand for spot rubber in the Amazon markets for the past month. February is one of the months when heavy rubber receipts are expected, which thus far have been abundantly realized. Rubber has been steadily coming in for the past three weeks and consequently prices are weak and

easier. There is a difference of 15 cents per pound, according to New York quotations, February 24, between First latex, Plantation and Upriver fine in favor of the former. Another reason why there is so little buying movement in Para sorts.

SINGAPORE.

Competitive buying seems to have been the cause of recent price advances in Singapore. It is reported that representatives of the large rubber manufacturers, with open buying orders, were bidding against each other with the effect of bulging the market.

It is almost impossible to secure sufficient cargo space to accommodate the demands of rubber shippers. There is an increasing amount of rubber going to the United States by the way of Kobe, Japan, and Hongkong, China.

The following are the freight rates from Singapore to Boston and New York via the Suez or Panama Canal on rubber and allied products:

Rubber, strap (cases).....	\$36.45 per 50 cubic feet.
Gutta (rubber) (cases) (Pontonak).....	38.88 per 50 cwt.
Gutta, school- or mixed and exceeding 24 cents per pound (c. i. f. in cases).....	41.31 per 50 cubic feet.
Bornico rubber (baskets).....	48.60 per 12 cwt.
Latex, Para and rubber, genuine (cases).....	48.60 per 50 cubic feet.
Gutta percha (cases).....	51.03 per 50 cubic feet.
Rubber, genuine (bags of bundles).....	72.90 per 20 cwt.

The through rate on rubber in cases from Port Swettenham is \$52.25 per 50 cubic feet. The rate on rubber in cases by steamers calling at Port Swettenham is \$48.60 per 50 cubic feet. [The equivalent of a ton (2,240 pounds) is figured at 40 cubic feet, a hundred weight (cwt.) 112 pounds.]

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and February 29, the current date:

PARA.	March 1, '15.	Feb. 1, '16.	Feb. 29, '16.
Upriver, fine, new.....	58 1/2 @	76 @	77 @ 78
Upriver, fine, old.....	60 @	72 @	72 @ 73
Upriver, fine, new.....	50 @	69 @	70 @ 71
Islands, fine, old.....	43 @	54 @	59 @ 60
Upriver, coarse, new.....	43 @	54 @	59 @ 60
Islands, coarse, new.....	28 @	35 @	37 @ 38
Islands, coarse, old.....	32 1/2 @	33 @	40 @ 41
Caucho, ball, upper.....	46 @ 48	59 @ 61	61 @ 62
Caucho, ball, lower.....	43 @ 44	56 @	58 @ 59

PLANTATION HEVEA.	Spot 62 @ 63	Spot 60 1/2 @ 61	Spot 91 @
Smoked sheet	Spot 65 @ 66	78 @	Spot 92 @ 93
rubbed.....	Prompt ship. 62 1/2 @ 63		Apr.-June 92 @ 93 1/2
First latex crepe:	Spot 62 @ 63		July-Dec. 89 @
	Prompt ship. 60 1/2 @ 61		Spot 93 @ 94
			Apr.-June 93 @ 94 1/2
			July-Dec. 90 @

Fine sheets and biscuits, unsmoked.....	59 @ 60	78 @	Spot 91 @
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CENTRALS.	44 @ 45	55 @ 56	57 @ 59
Cameroon, 44 @ 45	54 @ 55	57 @ 59	
Nicaragua, 44 @ 45	53 @ 54	56 @ 57	
Mexican plantation, sheet, 43 @ 44	53 @ 54	53 @ 54	
Mexican, scrap, 40 @ 41	35 @ 36	38 @ 40	
Mexican, slab, 40 @ 41	45 @ 46	50 @ 52 1/2	
Manabita, sheet, 37 1/2 @ 40	45 @ 46	42 @ 45	
Guayule, 41 @ 42	44 @ 46	46 @ 47	
Malaya, sheet, 56 @ 57	64 @	65 @ 66	
Malaya, block, 45 @ 46	40 @	46 @ 47	

AFRICANS.	44 @ 45	55 @ 56	57 @ 59
Lopori, ball, prime.....	59 @		
Lopori, strip, prime.....	62 @		
Upriver Congo, ball, red.....	72 @		
Red Niger, Nigori.....	76 @ 77	74 @ 75	
Canary Nigori.....	71 @ 72	74 @ 75	
Massai, red.....	51 1/2 @ 52 1/2		
Cameroon, ball, soft.....	46 @		
Cameroon, ball, hard.....	50 @		
Benue, No. 2.....	40 @ 41	46 @ 48	
Accra, flake.....	23 @ 24	38 @ 40	

Assam.....				58 @
Pontianak.....	7 1/2 @ 8	8 1/2 @	8 3/4	10 @ 10 1/2
Gutta Siak.....		13 @	13 1/2	15 @ 16 1/2
Gutta red Niger.....				27 1/2 @
Borneo III.....		35 @	35 1/2	
Gutta Percha.....	1.50 @ 2.00			1.50 @ 2.00

RUBBER AFLOAT TO THE UNITED STATES.

Steamship.	Cleared.	From.	To.	Pounds.
Yangtze	Dec. 10, 1915.	Penang	*Akron and Seattle.	44,275
Siamra	Dec. 11, 1915.	Penang	New York	4,480
Islandville	Dec. 15, 1915.	Penang	Seattle	12,243
Islandville	Dec. 17, 1915.	Penang	Boston	20,160
Namur	Dec. 25, 1915.	Penang	New York	6,275
Pyraus	Dec. 25, 1915.	Penang	New York	8,963

Total from Penang..... 208,997

Pyrrhus	Dec. 22, 1915.	Singapore	New York	22,400
Kasseng	Dec. 24, 1915.	Singapore	New York	14,367
Hyson	Dec. 25, 1915.	Singapore	San Francisco	3,467
Hyson	Dec. 25, 1915.	Singapore	Seattle	188,000
Hyson	Dec. 25, 1915.	Singapore	Akron	41,467
Hyson	Dec. 25, 1915.	Singapore	New York	216,800
Asia Maru	Dec. 26, 1915.	Singapore	New York	116,667
Atsuta Maru	Dec. 26, 1915.	Singapore	San Francisco	152,933
St. Jacob	Dec. 28, 1915.	Singapore	Akron	78,400
St. Jacob	Dec. 28, 1915.	Singapore	New York	159,067
Van Spilbergen	Dec. 29, 1915.	Singapore	Akron	89,600
Mongara	Jan. 6, 1916.	New York	New York	75,333
Mongara	Jan. 6, 1916.	Singapore	Akron	95,198

Total from Singapore..... 1,675,966

GUTTA JULUTONG (PONTIANAK).

St. Jacob	Dec. 28, 1915.	Singapore	*San Francisco	26,933
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*Via Hong Kong. *Via London

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, New York City), advises as follows:

During February the market for commercial paper continued about the same as in January, there being a good general demand from city banks and out of town, the best rubber names selling readily at 4 per cent, and those not so well known at 4½ to 5½ per cent, according to grade.

NEW YORK PRICES FOR JANUARY (NEW RUBBER).

	1914.	1915.	1916.
Upriver fine	\$0.73 @ 0.77	\$0.61 @ 0.75	\$0.77 @ 0.99
Upriver coarse	..44 @ .47	..45 @ .58	..60 @ .76
Islands fine	..59 @ .65	..58 @ .70	..75 @ .90
Islands coarse	..27 @ .31	..29 @ .37	..35 @ .53
Cameta	..35 @ .37	..31 @ .41	..39 @ .54

NEW YORK PRICES FROM FEBRUARY 1 TO 26 (NEW RUBBER).

	1914.	1915.	1916.
Upriver fine	\$0.75 @ 0.79	\$0.57 @ 0.61	\$0.73 @ 0.80
Upriver coarse	..46 @ .47	..44 @ .48	..52 @ .60
Islands fine	..64 @ .69	..50 @ .54	..67 @ .74
Islands coarse	..31 @ .32	..28 @ .32	..35 @ .38
Cameta	..35 @ .38	..30 @ .36	..37 @ .40

Plantation Rubber from the Far East.

TOTAL EXPORTS FROM MALAYA.

(From January 1, 1915, to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	Singapore.	Malacca.	Penang.	Port Swettenham.	January	Total.
Great Britain pounds	27,664,267	7,881,651	22,125,665	774,253	58,445,836	
Continent	4,310,933	17,333	801,599		5,129,865	
Japan	2,015,915				2,015,915	
Ceylon	248,450		516,666	47,192	812,308	
United States	42,692,667		4,132,467		46,825,134	
Australia	372,489				372,489	
Totals	77,604,691	7,898,984	27,576,397	821,445	113,901,517	
Same period, 1914.	77,566,695	5,318,379	20,009,367	2,052,620	64,947,051	
Same period, 1913.	24,803,020		12,925,467	1,366,990	39,095,477	
Same period, 1912.	13,689,653		4,057,932	735,677	18,483,262	

*From January 1 to January 8.

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to 17, 1915 and 1916. Compiled by the Ceylon Chamber of Commerce.)

To—	1915.	1916.
Great Britain	253,956	876,530
Canada and Newfoundland	122,290	
France	6,730	
United States		1,069,361
Australia		20,416
Totals	382,966	1,966,307

(Same period 1914, 521,357 pounds; same period, 1913, 481,560.)

The export figures for 1914 include the imports reexported. (These amount to 63,815 pounds.) To arrive at the total quantity of Ceylon rubber exported for that period deduct these imports from the total exports. The figures for 1915 and 1916 are for Ceylon rubber only.

SINGAPORE.

Guthrie & Co., Limited, report (January 12, 1916):

The rubber auction held today opened slowly and proceedings were very dull throughout.

Some very heavy declines in values have to be reported, the most notable being in fine pale crepe which, at \$186, was down \$23. Fine ribbed smoked sheet was neglected and most parcels were quickly withdrawn. One lot fetched \$187, but the average price obtained for the grade did not exceed \$179.

Ribbed and plain unsmoked sheet were \$20 and \$23 lower, at \$170 and \$167 respectively.

The lower grades came in for special attention and most parcels put up found ready buyers although at lower prices, the average decline being about \$14. Scrap shared in the general depression.

Of some 350 tons catalogued only 10 per cent. changed hands. The following was the course of values:

	In Singapore.	Sterling equivalent per pound in London.	Equivalent per pound in cents.
Sheet, fine ribbed smoked.....	175 @ 187	3 1/4 @ 3 1/2	78 5/8 @ 81.6
Sheet, fair to good ribbed smoked.....	170 @ 181	3 1/4 @ 3 1/2	80.58 @ 82.60
Sheet, plain smoked.....	167 @ 170	3 1/4 @ 3 1/2	77.00 @ 78.55
Sheet, ribbed, unsmoked.....	165 @ 167	3 1/4 @ 3 1/2	76.27 @ 77.03
Sheet, fine pale.....	184 @ 186	3 1/4 @ 3 1/2	84.37 @ 85.14
Crepe, good pale.....	170 @ 182	3 1/4 @ 3 1/2	82.35 @ 83.14
Crepe, fine brown.....	177 @ 183	3 1/4 @ 3 1/2	81.33 @ 83.87
Crepe, good brown.....	164 @ 178	3 1/4 @ 3 1/2	75.76 @ 81.84
Crepe, bark.....	120 @ 157	2 1/2 @ 3 1/2	57.27 @ 72.98
Scrap, virgin.....	112 @ 113	2 1/2 @ 2 1/2	53.72 @ 54.22
Scrap, pressed.....	14 @ 14	2 1/2 @ 2 1/2	6.08 @ 6.08
Scrap, loose.....	75 @ 107	1 1/4 @ 2 1/2	38.01 @ 51.70

*Pulc = 133 1/3 pounds.

[Figured at standard rate of exchange 1s. = 24.3 cents.]

[Quoted in S. S. dollars = 2/4 1/2 cents.]

STRAITS SETTLEMENTS RUBBER EXPORTS.

A cablegram from the government to the Malay States Information Agency gives the exports of plantation rubber from the Straits Settlements for the month of December as 3,005 tons compared with 4,292 tons in November last and 2,344 tons in the corresponding month of 1914. The total export for the year 1915 was 34,891 tons compared with 19,727 tons in 1914 and 11,889 tons in 1913.

It is interesting to note the enormous development of the rubber industry during the past few years in the Malay Peninsula. So recently as 1912, the total export from British Malaya (Straits Settlements, Federated Malay States and Unfederated States) amounted to 21,305 tons. In the year just closed the total export was 79,415 tons, or more than half of the whole world's production of wild and plantation rubber.

Appended are the comparative statistics for three years:

	1913.	1914.	1915.
January	784	1,181	2,576
February	743	1,703	2,741
March	898	1,285	2,477
April	762	1,548	1,978
May	814	1,308	3,508
June	812	1,480	2,249
July	1,120	1,584	2,324
August	1,115	1,323	2,995
September	1,057	1,602	4,725
October	1,144	2,006	2,641
November	1,105	3,370	4,292
December	1,217	2,334	3,005
Totals	11,889	19,727	34,891

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram from Kuala Lumpur announces that the export of plantation rubber from the Federated Malay States during the month of January amounted to 4,471 tons compared with 3,473 tons in the corresponding month last year and 2,542 tons in 1914.

CRUDE RUBBER IMPORTS AND EXPORTS OF THE UNITED KINGDOM FOR JANUARY, 1916.*

IMPORTS.				
	Pounds.		Value.	
	Jan., 1915.	Jan., 1916.	Jan., 1915.	Jan., 1916.
From—				
Dutch East Indies.....	633,200	573,000	\$338,349	\$434,868
French West Africa.....	20,400	138,000	8,879	73,459
Gold Coast.....	91,300	9,830	9,416	11,430
Other countries in Africa.....	887,300	526,900	349,609	249,245
Peru.....	71,000	281,500	34,939	200,699
Brazil.....	613,000	1,792,600	340,229	1,427,255
British India.....	437,000	527,800	248,989	436,997
Straits Settlements.....	7,727,800	5,061,500	3,909,394	3,962,348
Federated Malay States.....	2,443,200	3,134,600	1,340,879	2,462,805
Ceylon and dependencies.....	180,600	2,441,400	776,171	1,931,311
Other countries.....	213,100	224,200	120,178	172,063
Totals.....	17,307,900	14,779,800	\$8,878,035	\$11,384,900
Waste and reclaimed.....	104,500	609,800	\$11,795	\$81,833

EXPORTS—Foreign and Colonial.

	Pounds.		Value.	
	Jan., 1915.	Jan., 1916.	Jan., 1915.	Jan., 1916.
To—				
Russia	737,200	504,500	\$382,419	\$365,355
France	687,900	1,539,300	371,484	1,145,590
United States	766,600	4,873,200	389,553	3,530,796
Other countries	2,041,700	1,680,300	1,075,766	1,127,995
Totals	4,233,400	8,597,300	\$2,219,222	\$6,169,716

*Complete United Kingdom statistics for January, 1916, will appear in the April issue.

CRUDE RUBBER ARRIVALS AT THE PORT OF NEW YORK.

IMPORTS FROM PARA.

(The Figures Indicate Weight in Pounds.)

JANUARY 8. By the steamer *Huabulpa* from Iquitos:

	Fin.	Medium.	Coarse.	Total.
H. C. Kupper	43,750	21,000	29,700	94,450
G. Amsinck & Co.	26,850	2,900	24,300	54,050
H. A. Aslett & Co.	23,500	7,200	14,000	44,700
J. T. Johnstone & Co.	27,700		7,400	35,100
G. J. Amsinck & Co.	12,650	800	4,500	18,000
Chartered Bank of Spanish America	7,900		1,200	9,100
Rumsey & Greentree Co., Inc.	1,900		1,700	3,600
Totals	143,100	10,000	74,100	327,200

JANUARY 25. By the steamer *Minas Geraes* from Para:

Meyer & Brown	131,100	14,500	113,800	359,300
G. Amsinck & Co.	176,300	16,200	32,800	245,100
Arnold & Zeiss	90,700	22,000	47,400	300,800
Paul Bertsch	104,900	1,100	48,900	154,900
H. A. Aslett & Co.	53,900	17,500	59,500	131,200
Henderson & Korn	65,700		81,100	146,800
W. R. Grace & Co.	27,700		59,000	86,700
J. T. Johnstone & Co.			13,200	21,500
Robinson & Co.	7,100	700	5,300	13,100
F. D. Duen & Co.	4,300			4,300
Totals	661,700	72,000	402,000	1,135,700

JANUARY 29.—By the steamer *Frances* from Para & Manaoas:

Meyer & Brown	15,400	12,500	37,700	65,600
General Rubber Co.	311,100			311,100
G. Amsinck & Co.	174,200	11,800	110,700	396,700
Arnold & Zeiss	157,900	15,500	43,500	296,900
Alden's Successors, Ltd.	171,700	55,800	66,700	394,200

Robinson & Co.	173,600	35,500	13,000	222,100
Henderson & Korn	121,600	22,700	28,500	192,800
H. A. Aslett & Co.	64,900	15,000	45,800	125,700
W. R. Grace & Co.	25,800	7,100	6,600	39,500
F. H. Ross & Co.	19,400		10,000	29,400
Pell & Dumont	11,100	5,700	9,000	25,800
Cowdrey & Co.			1,100	1,100

Totals 1,246,700 189,000 488,300 2,904,000

FEBRUARY 8.—By the steamer *Hubert* from Para:

Meyer & Brown	49,100	4,600	20,200	73,900
Arnold & Zeiss	35,700	10,200	63,700	119,600
G. Amsinck & Co.	21,100	1,800	29,700	52,600
H. A. Aslett & Co.	35,400	12,600	60,300	108,300
Henderson & Korn	25,800	2,600	14,500	42,900
Davies, Turner & Co.	50,300		22,000	72,300
W. R. Grace & Co.	67,100	3,200	27,700	98,000
Alden's Successors, Ltd.		2,100	4,400	6,500
Hageneyer & Brunn	6,400	400	4,200	11,000

Totals 290,900 38,500 221,700 551,100

FEBRUARY 14.—By the steamer *Sao Paulo* from Para & Manaoas:

Meyer & Brown	101,200	11,200	50,300	162,700
G. Amsinck & Co.	162,800	1,900	49,900	214,600
Arnold & Zeiss	63,800	6,700	19,600	90,100
Alden's Successors, Ltd.		19,700	70,400	120,100
Paul Bertsch	46,700		14,800	61,500
H. A. Aslett & Co.	10,600	2,400	52,800	65,800
Henderson & Korn	1,700	1,100	15,300	18,100
W. R. Grace & Co.	5,700	400	2,200	8,300
F. H. Ross & Co.	900	100	100	1,100
Davies, Turner & Co.	17,500	2,100	5,000	24,600

Totals 410,900 63,400 272,500 746,800

PARAS FROM EUROPE.

POUNDS.

JANUARY 24.—By the *Cyprus*—Liverpool:
Alden's Successors, Ltd. (Europe)..... 143,700JANUARY 27.—By the *Athina*—Colon:
G. Amsinck & Co. (Caucho)..... 4,000
W. R. Grace & Co. (Fine)..... 6,500
Gravenhorst & Co. (Fine)..... 3,200FEBRUARY 3.—By the *Colon*—Colon:
G. Amsinck & Co. (Fine)..... 8,500
W. R. Grace & Co. (Fine)..... 10,700FEBRUARY 14.—By the *Cristobal*—Colon:
G. Amsinck & Co. (Fine)..... 14,300
G. Amsinck & Co. (Caucho)..... 17,300
W. R. Grace & Co. (Fine)..... 3,000
Cobley & Co. (Fine)..... 1,400
Eastmond & Co. (Fine)..... 900

EAST INDIAN AND AFRICANS.

JANUARY 24.—By the *Quebra*—Liverpool:
Robert Badenhop Co..... 22,500
J. T. Johnstone & Co..... 22,500JANUARY 27.—By the *Cyprus*—Liverpool:
General Rubber Co..... 6,000JANUARY 7.—By the *Indra*—Batavia:
General Rubber Co..... 160,000JANUARY 19.—By the *Lapland*—Liverpool:
Various..... 33,500JANUARY 31.—By the *Asatara*—London:
Various..... 7,000FEBRUARY 11.—By the *Phonon*—London:
W. H. Selwyn..... 60,000
S. R. Southera..... 78,000FEBRUARY 4.—By the *Argyle*—London:
J. T. Johnstone & Co..... 3,000
Robert Badenhop Co..... 7,000FEBRUARY 5.—By the *Chicago*—Bordeaux:
Rubber Trading Co..... 25,000
Rumsey & Greentree Co., Inc. 11,200FEBRUARY 7.—By the *Fayle*—Liverpool:
Arnold & Zeiss..... 14,000
Robert Badenhop Co..... 47,000

Various..... 6,000

FEBRUARY 8.—By the *Hubert*—Natal:
Alden's Successors, Ltd..... 25,000FEBRUARY 9.—By the *Suzara*—London:
S. R. Southera..... 245,000FEBRUARY 10.—By the *Phon*—Batavia—Liverpool:
Meyer & Brown..... 11,200
Arnold & Zeiss..... 75,000
Various..... 2,500

POUNDS.

FEBRUARY 14.—By the *Adriatic*—Liverpool:
Various..... 31,200FEBRUARY 14.—By the *Saron Monarch*—London:
J. T. Johnstone & Co..... 6,000FEBRUARY 16.—By the *Idaho*—Hull:
J. T. Johnstone & Co..... 22,500FEBRUARY 16.—By the *Ordana*—Liverpool:
Robert Badenhop Co..... 15,000
Rubber Trading Co..... 17,000
Gouldy Tire & Rubber Co..... 22,500FEBRUARY 17.—By the *Galileo*—Hull:
J. T. Johnstone & Co..... 11,200

CENTRALS.

JANUARY 24.—By the *Ticinas*—Puerto Barrios:
Rosenthal & Sons..... 3,000
E. H. Vivian..... 500JANUARY 24.—By the *Pastora*—Port Limon:
Gontard & Co..... 1,200
Isaac Brandon & Bros..... 1,000
H. Marquardt & Co..... 600JANUARY 27.—By the *Alliance*—Colon:
G. Amsinck & Co..... 6,000
W. R. Grace & Co..... 4,600Lawrence Johnson & Co..... 42,800
Fido, Calvo & Co..... 25,200
Isaac Brandon & Bros..... 28,000Fidancie Bros. & Sons..... 300
FEBRUARY 1.—By the *Calamores*—Port Limon:
Isaac Brandon & Bros..... 3,000
United Fruit Co..... 500Kunhardt & Co..... 1,000
FEBRUARY 3.—By the *Colon*—Colon:
G. Amsinck & Co..... 12,500
Otto Gerdau Co..... 1,900Lawrence Johnson & Co..... 6,000
Andreas Fruehling Co..... 5,100
American Trading Co..... 1,500Coffert & Co..... 1,600
Kunhardt & Co. Spanish Am..... 41,900FEBRUARY 3.—By the *Campana*—Mexico:
American Trading Co..... 27,000FEBRUARY 4.—By the *Corillo*—Cartagena:
De Lima, Cortisoso & Co..... 1,500
Andreas Fruehling Co..... 1,000FEBRUARY 7.—By the *Fayle*—Liverpool:
G. Amsinck & Co..... 100
FEBRUARY 8.—By the *Hubert*—Natal:
I. A. Medina & Co..... 1,500
Graham, Hinkley & Co..... 1,200General Export & Commission Co..... 800
H. Marquardt & Co..... 800
Various..... 8,000

POUNDS.

FEBRUARY 8.—By the *Sierra*—Puerto Barrios:
Rosenthal & Sons..... 1,500FEBRUARY 8.—By the *Denador*—Port Limon:
Meyer & Co..... 3,500
Isaac Brandon & Bros..... 1,500A. A. Linde & Co..... 500
V. Held..... 700FEBRUARY 11.—By the *Santa Maria*—Cartagena:
G. Amsinck & Co..... 14,500
V. Held..... 2,200FEBRUARY 14.—By the *Cristobal*—Colon:
G. Amsinck & Co..... 24,800
A. M. Capen's Sons..... 3,500A. M. Capen's Sons..... 3,500
Lawrence Johnson & Co..... 12,100
Pablo, Calvo & Co..... 2,800R. G. Barthold..... 800
Meyer & Co..... 1,600
American Trading Co..... 4,700Lanman & Kemp..... 1,500
Kettberg, Beiling & Co..... 4,800
Gravenhorst & Co..... 5,400C. E. Manuel..... 2,500
FEBRUARY 14.—By the *Comm*—New Orleans:
E. Steiger & Co..... 32,000
Lanman & Kemp..... 29,500Harburger & Stack..... 4,000
G. Amsinck & Co..... 1,500
Ph. Neider..... 1,000H. Miller..... 44,500
FEBRUARY 16.—By the *Metapan*—Port Limon:
Isaac Brandon & Bros..... 700FEBRUARY 18.—By the *Manzanillo*—Mexico:
American Trading Co..... 6,000

MANICORA AND CAUCHO.

JANUARY 25.—By the *Minas Geraes*—Pernambuco:
I. H. Rosshack Bros..... 8,500JANUARY 28.—By the *Minas Geraes*—Bahia:
Alden's Successors, Ltd..... 29,500
Various..... 10,800FEBRUARY 7.—By the *Fayle*—Liverpool:
Arnold & Zeiss..... 4,500FEBRUARY 8.—By the *Scottish Prince*—Bahia:
Adolph Hirsch & Co..... 45,000
J. H. Rosshack Bros..... 74,500FEBRUARY 7.—By the *Fayle*—Liverpool:
Arnold & Zeiss..... 17,000FEBRUARY 8.—By the *Hubert*—Natal:
I. H. Rosshack Bros..... 100,000
Various..... 29,500FEBRUARY 8.—By the *Hubert*—Natal:
I. H. Rosshack Bros. (Manicora)..... 13,500

EXPORTS.

Figures issued from January 25, 1915, to February 24, 1916.

EXPORTED TO	Belting, Hose and Packings	Footwear		Tires		Insulated Wire and Cable	Other man- uf. of India Rubber	Fountain Pens	Chewing Gum	Reclaimed Rubber	Scrap Rubber
		Boots	Shoes	Auto.	Other						
EUROPE:											
Denmark			\$938		\$1,440						
France	\$32,28	\$3,079	6,042			\$18,872	\$36,373		\$1,475	\$1,912	\$4,662
Greece					443		195				
Italy			250	\$8,228	3,420	361	678				
Netherlands			30	1,244	4,600	1,494	\$1,450				
Norway	750		1,060	461	340	11,073	489				
Portugal	30		215		53	591	200				
Russia in Europe				451,282		5,537	210				
Spain						585	1,525	137			
Sweden						20,888					
Switzerland			2,223				202				
United Kingdom—											
England	56,651	12,626	1,731	291,405	34,811		113,926	2,674	8,870	9,206	13,057
Scotland	633			7,366	2,280		1,531	498			16,786
Totals, Europe	\$61,445	\$15,705	\$12,444	\$758,987	\$65,451	\$40,443	\$157,214	\$4,959	\$10,245	\$11,118	\$34,505
NORTH AMERICA:											
Bermuda	\$33			\$1,311	\$591	\$594	\$129		\$20		
British Honduras	18		368				155				
Canada							24				
Central American States—				25	392	923	272		333		
Costa Rica	480					4	333				
Guatemala	126				65	16	534				
Honduras				106			216				
Nicaragua	51						1				
Panama	13,164		808	5,651	596	3,182	3,185	\$174	2,054		
Salvador	21,108			256		11	968		25		
Mexico	37			23,650	6,857	1,158	2,702				
Newfoundland and Labrador		\$1,635	1,596		2,146	50	56	5	202		
West Indies—											
British—											
Barbados				344	5		31				
Jamaica	105			885	74		346	10	15		
Trinidad and Tobago	698			1,293		15					
Other British	94		10	599	185	75	199	17	10		
Cuba	7,854	9	571	22,378	2,346	12,115	20,819	726	634	159	
Danish	4				11						
Dutch	74			311	2,042	43	1				
French	3			191		11		126			
Haiti	67			103	197	77	243		22		
Santo Domingo	203		94	1,268	780	29	318	1			
Totals, North America	\$44,119	\$1,644	\$3,777	\$58,374	\$16,287	\$17,380	\$30,632	\$1,195	\$3,290	\$186	
SOUTH AMERICA:											
Argentina	\$1,796		\$1,442	\$43,379	\$2,740	\$19,741	\$13,136	\$355	\$3,262		
Bolivia	175				17		83				
Brazil	4,799	\$95	462	30,341	2,527	8,187	17,984	627			
Chile	16,389	1,661	1,251	976	1,295	2,789	1,566		590		
Colombia	693		277	2,941	691	2,487	1,154		158		
Ecuador	186		241	1,245	1,277	130	698				
Guiana	61		323	309		47			8		
British								110			
Dutch				331	308	231	819				
Peru	2,280			10,229	574	252	3,629				
Uruguay	1,094			2,374	665	469	1,696		174		
Venezuela	1,235		91								
Totals, South America	\$28,708	\$1,097	\$3,960	\$92,125	\$10,094	\$33,313	\$41,063	\$1,092	\$4,192		
ASIA:											
Aden				\$442							
China	\$199					\$6,985	\$409		\$126		
British East Indies—											
British India	301			10,594	\$8,171	20,628	550	\$1,710	75		
Straits Settlements				1,888	180		412		1,111		
Dutch East Indies	90			8,604	266	3,823	541	84			
Hongkong							25				
Japan			\$373			150	2,804			\$2,538	
Russia in Asia	364										
Totals, Asia	\$954		\$373	\$21,528	\$8,617	\$31,586	\$4,841	\$1,794	\$1,312	\$2,538	
OCEANIA:											
British—											
Australia and Tasmania	\$3,174	\$38	\$9,645	\$195,953	\$1,480	\$9,330	\$6,695	\$9	\$7,233		
New Zealand	456	\$8,522	97	835			5,878		500		
French	232										
Philippine Islands	512		\$32	287	2,318	68	3,521	270			
Totals, Oceania	\$4,374	\$8,350	\$10,274	\$197,075	\$3,798	\$9,398	\$16,094	\$79	\$7,433		
AFRICA:											
British Africa—											
West				\$2,789			\$3,782			\$503	
South	\$3,583	\$264	\$2,473	19,829	\$36,216		\$1,667				
East				585							
Canary Islands				834						270	
Egypt											
Portuguese Africa	2,167										
Totals, Africa	\$5,750	\$264	\$2,473	\$24,037	\$36,216	\$3,782	\$1,667		\$773		

In addition to the above the following items were exported during the same period: To England—Aeroplanes, \$22,320, and balata, \$2,982, and aeroplanes to Brazil, \$315.

IMPORTS OF CRUDE RUBBER AND BALATA AT BORDEAUX, FRANCE

FOR 1915 AND THE LAST 6 MONTHS OF 1914.

	New Caledonia.	Soudan Niggers.	Conakry and Noumea.	Upper Congo.	Ivory Coast Flakes.	Madagascar.	Mali Cob.	Casamance.	Centrals.	Bissau Niggers.	Rubber Taps in Pounds.	Banata. Pounds.
1915—												
January	405	75,350	.....	990	143	.....	776	.....	600	77,693	3,165
February	640	.....	.....	.....	.....	.....	.....	.....	.....	134,156	3,868
March and April	396	47,530	52,600	1,320	2,649	9,900	.....	.....	19,580	33,165	8,212
May	11,000	.....	1,045	6,160	.....	.....	.....	.....	.....	.....
June	26,250	9,680	151,200	4,070	6,160	13,100	14,960	.....	33,165	9,026
July	28,600	13,200	2,123	1,100	82,060	6,340	2,090	.....	448,810	3,868
August	770	4,620	105,160	9,130	.....	.....	136,323	.....
September	86,340	55,530	49,354	19,460	.....	4,900	.....	.....	119,650	23,650
October	26,697	67,100	216,700	12,100	.....	.....	.....	.....	.....	190,134	51,227
November	990	.....	.....	10,780	.....	2,970	.....	.....	.....	649,209	.....
December	121,440	13,860	5,280	.....	2,310	.....	.....	.....	100,740	20,240
Totals	29,128	700,150	483,680	82,522	52,393	205,766	46,610	17,050	20,240	1,631,475	142,736
1914—												
July	1,320	3,630	.....	13,090	3,300	.....	.....	.....	.....	21,340	8,800
August	880	.....	.....	660	.....	.....	.....	.....	.....	1,540	770
September	7,920	.....	.....	.....	.....	.....	7,920	6,660
October	2,420	.....	.....	.....	.....	.....	4,420	6,930
November and December	770	13,200	72,600	1,760	.....	.....	88,330	.....	.....	88,330	18,700
Totals	1,650	14,520	76,230	25,850	3,300	.....	.....	.....	.....	111,530	34,760

In addition to the above the following was imported: During August, 1915, Tonkin 220 pounds; during November and December, 1914, Gambia 220 pounds and Lahou Cakes 8,580 pounds.

EXPORTS OF INDIA RUBBER FROM MANAOS DURING 1915.

	NEW YORK.						EUROPE.					
EXPORTERS.	Fine.	Medium.	Coarse.	Caucho.	Total.		Fine.	Medium.	Coarse.	Caucho.	Total.	Grand Total.
Suter & Co.,	943,414	76,396	334,856	562,310	1,916,796	561,070	.....	51,164	9,876	225,154	847,264	2,764,240
General Rubber Co. of Brazil,	938,821	195,488	397,844	307,090	1,839,243	943,639	.....	205,657	56,017	260,270	1,450,560	3,295,806
Edwards & Sons,	190,158	.....	.....	240,549	1,109,459	.....	.....	1,109,459	.....	125,254	1,450,993	3,295,806
Adelbert H. Alden, limited,	77,805	90,240	118,025	19,407	305,657	743,753	.....	65,477	10,921	1,170,473	1,476,130	.....
Tancredi Porto & Co.,	357,985	73,047	.....	27,956	534,785	414,936	.....	91,448	72,245	98,084	676,713	1,211,498
G. Pradich,	180,306	21,381	157,936	149,935	509,552	855,612	.....	111,033	33,063	57,130	686,837	1,196,590
L. G. Agazio, .....	.....	3,852	7,094	.....	32,109	.....	.....	.....	.....	17,459	244,503	.....
Stowell & Sons, .....	.....	.....	.....	.....	.....	113,253	.....	10,208	6,538	41,460	171,459	244,503
S. A. Armegans Andresen,	102,763	7,986	11,999	5,297	128,045	122,875	.....	.....	.....	.....	128,045	.....
H. B. Brown,	4,429	3,681	.....	.....	343,993	299,508	.....	.....	.....	.....	40,487	90,487
Semper & Co.,	14,729	2,168	10,285	4,068	31,000	44,430	4,415	.....	6,007	11,615	58,300	102,395
Ammorim Irmaos.,	18,509	3,543	8,104	2,198	32,355	28,934	4,208	.....	4,132	2,610	39,881	72,004
H. Balding,	20,362	.....	.....	.....	20,362	31,166	.....	.....	.....	311	20,165	51,642
Pinto Accoroni,	3,038	.....	.....	.....	45,736	.....	.....	.....	.....	.....	.....	45,736
G. Dessner & Co.,	37,782	.....	1,800	44	39,626	.....	.....	.....	.....	.....	.....	39,626
Pinho Certo & Co.,	14,200	2,753	1,717	2,770	21,440	14,560	1,120	.....	320	.....	16,000	37,440
Nicolaus & Co., .....	.....	5,640	.....	.....	5,640	800	.....	.....	800	.....	25,100	30,740
Sundries,	47,968	4,589	12,882	1,508	66,947	17,468	4,027	33,816	19,198	.....	64,509	131,456
In transit, Iquitos,	4,127,071	564,859	1,625,694	1,366,598	7,684,222	4,441,764	661,447	440,440	1,121,847	6,666,532	13,500,744	.....
.....	485,149	44,972	158,382	743,450	1,431,953	333,482	36,612	115,020	426,850	1,111,934	2,534,887	.....
Totals,	4,612,220	609,831	1,784,075	2,110,438	9,116,175	4,976,216	698,083	555,460	1,548,697	7,778,456	16,694,663	.....

YEARLY EXPORTS AND IMPORTS OF CRUDE AND MANUFACTURED RUBBER BY COUNTRIES

EXPORTS—BALATA, CRUDE AND SCRAP RUBBER.

	1914.		1913.	
	Tons.	Value.	Tons.	Value.
Federated Malay States—rubber	30,697	44,524		
Para To Europe	15,985	14,400		
To United States.....	21,690	22,960		
	1913.		1914.	
	Tons.	Value.	Tons.	Value.
British Guiana—belata	78,710	\$34,070		
rubber	961	630		
Italy (Piedmont)—reclaimed:				
To U. S. and possession		22,000		
Panama—belata	210,932	65,859		
rubber	12,195	11,717		
Russia	33,000	73,000		
To United States.....	10,314			
	1912.		1913.	
	Tons.	Value.	Tons.	Value.
French West Africa—rubber	1,877	\$1,859	2,942	\$2,721

EXPORTS—RUBBER MANUFACTURES

	1914.		1915.	
	Tons.	Value	Tons.	Value.
Japan- United States.....		\$345,621		\$1,218,065
Scrap.....	2,094	408,978	1,556	356,350
Belgium.....	3,115	67,398	3,100	810,863
Belting, hose and packing.....		2,098,506		2,142,556
Rubber boots.....pairs	262,295	616,692	348,466	1,226,681
Rubber shoes.....pairs	1,675,856	1,402,503	2,098,531	1,475,697
Automobile tires.....				
For Belgium.....		\$301		
Germany.....		81,917		
England.....		1,458,777		\$6,698,584
Canada.....		869,909		1,185,230
Mexico.....		76,581		152,758
Cuba.....		*		356,903
Australia.....		*		563,439
Philippines.....		156,235		292,735
Other countries.....		674,306		2,165,112
Totals.....		\$3,315,116		\$11,415,481
All other tires.....		\$452,882		\$1,995,319
All other rubber manufactures.....		3,016,098		5,100,959

IMPORTS—CRUDE RUBBER AND GUTTA PERCHA.

	1913.		1914.	
	Tons.	Value.	Tons.	Value.
Russia:				
From France	\$164,000.
Germany	3,182,000.
United Kingdom	6,881,000.
Netherlands	560,000.
United States	797,000.
Other countries	3,223,000.
Totals		\$20,678,000.		\$14,807,000.

IMPORTS—RUBBER MANUFACTURES.

	1913.		1914.	
	Tons.	Value.	Tons.	Value.
Algeria from U. S.	1912-13.	\$8,299	1913-14.	\$9,409
Persia footwear		\$231,744		\$317,285

*No itemized figures available.

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF RUBBER AND RUBBER MANUFACTURES.

Articles	November, 1915.		Eleven Months Ending November, 1915.	
	Pounds.	Value.	Pounds.	Value.
Unmanufactured—				
Banks	268,162	\$95,721	2,045,386	\$770,947
Guayule gum	.....	.....	4,902,291	1,356,537
Gutta percha	1,342,375	50,172	18,733,068	875,448
Gutta percha	170,426	21,148	2,016,483	237,819
Total	1,780,963	\$167,041	7,687,228	\$3,240,751

India rubber	.....	.....	.....	.....
From Panama	50,560	\$22,444	270,592	\$123,186
German	.....	.....	6,987	843
Portugal	244,156	80,009	4,065,932	1,451,843
United Kingdom	5,878,663	3,229,791	80,120,179	43,147,626
British Honduras	71,940	29,404	1,135,860	504,709
Mexico	132,853	50,431	1,624,394	612,712
Brazil	5,009,241	1,887,162	46,665,741	19,357,763
Other South America	746,796	282,691	5,641,403	2,391,386
East Indies	7,115,436	3,724,395	52,597,336	27,673,973
Other countries	13,620	12,853	5,063,957	2,650,329
Total	19,272,465	\$9,319,160	197,192,381	\$98,089,361

Rubber scrap	1,081,092	\$80,070	11,092,410	\$786,324
Total unmanufactured	.....	\$9,767,271	.....	\$102,116,436
Chicle	462,983	\$150,138	7,413,543	\$2,720,796

Manufactured—				
Gutta percha	.....	\$155	.....	\$6,112
India rubber	.....	31,242	.....	420,759
Total manufactured	.....	\$31,397	.....	\$420,871
Substitutes elastic, etc.	.....	\$2,694	.....	\$16,632

EXPORTS OF DOMESTIC MERCHANDISE.

Scrap and old rubber	300,887	\$23,213	2,825,923	\$313,562
Reclaimed rubber	555,316	71,159	5,678,868	760,843
Belt, hose and packing	.....	.....	168,280	1,804,652
Rubber boots	80,917	188,119	423,494	963,720
Rubber shoes	223,123	111,223	1,951,810	1,398,213
Automobile tires	.....	.....	.....	.....
To England	.....	825,394	.....	5,863,285
Canada	.....	128,746	.....	1,104,846
Mexico	.....	24,652	.....	133,463
Cuba	.....	24,443	.....	295,286
Australia	.....	54,468	.....	466,993
Philippines	.....	25,528	.....	286,733
Other countries	.....	285,414	.....	1,681,402
Total	.....	\$1,365,445	.....	\$9,814,008

All other tires	.....	\$526,605	.....	\$1,821,547
Fountain pens	10,289	9,409	190,198	197,925
Other rubber manufactures	.....	\$26,605	.....	4,617,212
Total manufactured	.....	\$2,760,096	.....	\$21,493,425

EXPORTS OF FOREIGN MERCHANDISE.

Unmanufactured—				
Balata	.....	784,360	.....	\$307,470
Guayule gum	.....	.....	47,391	16,701
Gutta percha	2,611	\$287	2,723	305
Gutta percha	814	569	49,992	10,866
India rubber	469,258	226,074	4,508,139	2,261,519
Scrap and refuse	6,742	438	13,687	1,107
Total unmanufactured	.....	\$227,368	.....	\$2,597,977
Chicle	613	\$198	454,143	\$150,851

Manufactured—				
Gutta percha	.....	.....	.....	\$185
India rubber	.....	\$2,394	.....	10,708
Total	.....	\$2,394	.....	\$10,893
Substitutes elastic, etc.	.....	.....	.....	\$364

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

To Alaska	.....	.....	.....	.....
Belt, hose and packing	\$3,140	.....	\$110,842	.....
Boots and shoes	8,263	59,597	17,245	.....
Other rubber manufactures	1,280	.....	24,648	.....
Total	\$12,683	.....	\$308,135	.....
To Hawaii	.....	.....	.....	.....
Belt, hose and packing	\$6,942	.....	\$66,532	.....
Automobile tires	43,045	.....	404,372	.....
Other tires	4,761	.....	50,395	.....
Other rubber manufactures	10,054	.....	6,594	.....
Total	\$68,802	.....	\$583,693	.....

Philippine Islands	.....	.....	.....	.....
Belt, hose and packing	\$4,256	.....	\$48,260	.....
Boots and shoes	804	1,328	36,438	33,635
Tires	34,533	.....	359,931	.....
Other rubber manufactures	4,692	.....	122,247	.....
Total	\$44,809	.....	\$564,073	.....

Puerto Rico:

Belt, hose and packing	\$4,677	.....	\$31,155	.....
Automobile tires	23,669	.....	280,630	.....
Other tires	2,271	.....	27,317	.....
Other rubber manufactures	4,645	.....	60,535	.....
Total	\$34,662	.....	\$399,637	.....

RUBBER STATISTICS FOR CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

Unmanufactured, Free	November, 1915.		Eight Months Ending November, 1915.	
	Pounds.	Value.	Pounds.	Value.
Rubber and gutta percha, crude				
From Great Britain	451,681	\$252,482	3,228,519	\$1,771,313
United States	487,865	238,995	2,812,197	1,400,869
Brit. Straits Settlements	.....	.....	22,574	11,659
Other countries	26,880	14,087	196,778	93,579
Totals	966,426	\$505,564	6,360,068	\$3,277,424

Rubber, recovered:				
From Great Britain	.....	4,392	.....	\$2,482
United States	352,444	\$42,121	3,073,251	385,047
Totals	352,444	\$42,121	3,077,643	\$387,529

Hard rubber, in sheets and rods				
From Great Britain	.....	4	.....	\$5
United States	43,621	\$5,316	93,671	10,987
Totals	43,621	\$5,316	93,671	\$10,992

Rubber substitute:				
From Great Britain	5,824	\$646	16,644	\$1,812
United States	29,243	2,147	299,068	21,855
Totals	35,067	\$2,793	315,712	\$23,667

Rubber, powdered, and rubber or gutta percha waste:				
From Great Britain	4,605	\$362	7,314	\$579
United States	123,546	4,491	837,050	\$1,216
Other countries	9,415	407	12,394	534
Totals	137,566	\$5,260	856,758	\$52,329

Rubber thread, not covered:				
From United States	2,632	\$3,406	19,462	\$26,651
Balata, crude:				
From United States	.....	.....	1,644	\$991

Chicle, crude:				
From Great Britain	.....	.....	2,888	\$1,675
United States	3,412	\$1,225	182,971	71,757
British Honduras	.....	.....	787,008	289,622
Mexico	.....	.....	185,093	69,737
Totals	3,412	\$1,225	1,157,960	\$432,791

Manufactured, Duty Free	November, 1915.		Eight Months Ending November, 1915.	
	General Tariff Value.	Preferential Tariff Value.	General Tariff Value.	Preferential Tariff Value.
Waterproof clothing:				
From Great Britain	\$47	\$17,701	\$3,454	\$265,445
United States	4,399	.....	74,980	.....
Other countries	.....	.....	21	.....
Totals	\$4,446	\$17,701	\$78,455	\$265,445

Hose, lined with rubber:				
From Great Britain	.....	.....	.....	\$389
United States	\$5,957	.....	\$49,929	.....
Totals	\$5,957	.....	\$49,929	\$389

Mats and mattings:				
From Great Britain	.....	\$1	.....	\$85
United States	\$36	.....	\$930	.....
Totals	\$36	\$1	\$930	\$85

Packing:				
From Great Britain	.....	\$181	.....	\$1,153
United States	\$4,061	.....	34,192	.....
Totals	\$4,061	\$181	\$34,302	\$1,153

Tires of rubber for all vehicles:				
From Great Britain	\$21	\$3,532	\$9,992	\$20,959
United States	177,211	.....	998,108	.....
France	242	.....	15,619	.....
Other countries	.....	.....	1,130	.....
Totals	\$177,474	\$3,532	\$1,014,849	\$20,959

*Rubber cement and all manufactures of india rubber and gutta percha, N. O. P.:

	From Great Britain	United States	Other countries	Totals
From Great Britain	\$484	\$2,181	\$2,108	\$11,783
United States	5,127	37,108	682	42,917
Other countries	74	682	682	1,438
Totals	\$5,681	\$39,891	\$3,470	\$49,042

Have rubber in tubes:

	From Great Britain	United States	Other countries	Totals
From Great Britain	807	5,127	682	6,616
United States	5,127	37,108	682	42,917
Other countries	74	682	682	1,438
Totals	\$5,681	\$39,891	\$3,470	\$49,042

Boots and shoes:

	From Great Britain	United States	Other countries	Totals
From Great Britain	\$11,540	\$58,584	10	\$70,134
United States	\$11,540	\$58,584	10	\$70,134
Other countries	10	10	10	30
Totals	\$11,540	\$58,584	10	\$70,134

Belting:

	From Great Britain	United States	Other countries	Totals
From Great Britain	\$1,053	\$34,933	10	\$35,996
United States	\$1,053	\$34,933	10	\$35,996
Other countries	10	10	10	30
Totals	\$1,053	\$34,933	10	\$35,996

Webbing (over one inch wide):

	From Great Britain	United States	Other countries	Totals
From Great Britain	\$1,478	\$42	\$7,930	\$9,450
United States	\$1,478	\$42	\$7,930	\$9,450
Other countries	10	10	10	30
Totals	\$1,478	\$42	\$7,930	\$9,450

*In addition, the imports of rubber cement and all manufactures of india rubber and gutta percha not otherwise provided for amounted to \$11 from Great Britain and \$230 from other countries for November, and \$207 from Great Britain, and \$1,535 from other countries for the eight months ending November, 1915, the values being at treaty rates.

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	November, 1915.	Eight Months Ending November, 1915.
	Prod. of U.S.	Prod. of U.S.
	Value.	Value.
MANUFACTURED DOMESTIC:		
Belting:		
To United States	\$87	\$424
Newfoundland	38	112
Other countries	10	33
Totals	\$135	\$569
Hoos:		
To Great Britain	\$8,465	\$11,608
United States	682	3,804
Newfoundland	71	2,966
Other countries	10	1,760
Totals	\$7,248	\$20,138
Boots and shoes:		
To Great Britain	\$191,481	\$258,385
United States	9	3,526
Newfoundland	10,182	56,066
Australia	10,182	2,013
Other countries	2,584	15,168
Totals	\$214,731	\$335,158
Mats and snathing:		
To various countries		\$418
Clothing:		
To Great Britain		\$97
United States		49
Newfoundland		140
Other countries		62
Totals		\$268
*Rubber waste:		
To United States	\$38,357	\$358,607
All other mfr., N. O. P.:		
To Great Britain	\$81,135	\$526,596
United States	147,771	89,367
Newfoundland	359	4,526
Australia	2,964	2,964
Other countries	4,391	66,349
Totals	\$197,791	\$1,135,689
Asphalt:		
To Great Britain	\$10,000	\$10,000
United States	44,764	467,703
Other countries		4,216
Totals	\$49,204	\$519,919

*During November, 613,800 pounds of rubber waste was exported to United States, making a total of 3,897,500 pounds for the eight months ending November, 1915.

*During November, 10,000 pounds of gum chicle was exported to Great Britain, and 104,731 pounds to the United States. During the eight months ending November, 1915, 20,000 pounds of gum chicle was exported to Great Britain, 1,078,585 to the United States, and 66,834 pounds to other countries.

UNITED KINGDOM RUBBER STATISTICS FOR 1915.

	IMPORTS.			
	December, 1915.		Total, 1915.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED:				
From India	346,000	\$211,595	1,179,233	\$744,484
From West Africa	390,500	179,723	1,179,233	744,484
From other countries	44,300	15,476	1,179,233	744,484
Totals	780,800	406,794	2,358,466	1,489,192
MANUFACTURED:				
From India	533,800	248,132	1,655,500	2,611,193
From West Africa	12,300	9,365	1,655,500	2,611,193
From other countries	1,839,200	1,093,530	2,611,193	4,272,016
Totals	2,485,300	1,350,027	5,922,293	7,494,392
Waste and reclaimed rubber:				
From India	4,396,890	2,896,599	66,053,200	35,890,274
From West Africa	1,927,790	1,284,551	28,880,300	16,332,745
From other countries	2,026,000	1,392,720	28,880,300	16,332,745
Totals	8,350,680	5,573,870	123,813,800	68,555,764
Exports:				
To India	12,121,800	\$7,768,316	176,045,600	\$95,221,013
To West Africa	3,25,000	\$18,350	1,179,233	\$744,484
To other countries	980,800	\$1,587	1,179,233	\$744,484
Totals	16,352,600	\$7,787,253	178,394,066	\$96,709,941

	EXPORTS.			
	December, 1915.		Total, 1915.	
	Pounds.	Value.	Pounds.	Value.
MANUFACTURED:				
Apparel, waterproofed:				
To France		\$45,032		\$217,854
British South Africa		10,269		203,342
British East Indies		3,645		12,815
Australia		13,977		231,633
New Zealand		16,971		147,977
Canada		9,168		431,933
Other countries		57,644		1,203,083
Totals		\$156,706		\$2,552,637
Boots and shoes, design patent	10,329	\$74,668	118,716	\$677,192
Insulated wire		170,642		1,786,849
Submarine cables		28,538		1,745,863
Automobile tires and tubes		280,427		3,231,482
Motorcycle tires and tubes		32,746		82,095
Cycle tires and tubes		233,385		2,095,331
Tires not specified		58,906		536,198
Manufactures not specified		\$35,003		\$1,159,084

	EXPORTS—FOREIGN AND COLONIAL.			
	December, 1915.		Total, 1915.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED:				
Cheese rubber				
To Russia	1,755,500	\$961,291	35,006,100	\$1,893,977
France	1,540,100	\$1,740,740	15,209,700	\$6,612,406
United States	5,076,000	2,935,424	83,180,100	45,071,227
Other countries	1,757,500	1,041,333	17,989,500	10,014,701
Totals	10,129,100	\$5,871,588	142,285,400	\$77,592,311
Waste and reclaimed:				
To Russia	10,129,100	\$4,219	142,285,400	\$100,447
To other countries	3,250,000	142,755	88,300	\$67,906
Totals	13,379,100	\$4,361,743	142,373,700	\$100,514,247
MANUFACTURED:				
Apparel, waterproofed				
To India		\$1,011		\$3,378
To West Africa		1,144		85,453
Insulated wire		11,829		44,027
Automobile tires and tubes		162,958		2,733,536
Motorcycle tires and tubes		4,096		66,893
Cycle tires and tubes		4,243		112,655
Tires not specified		268		31,940

*Included in "Rubber" prior to 1913. After 1911 "Waste and Reclaimed" is separated from "Waste" and "Waste and Reclaimed."

BURMA'S PACKING TRADE.

Engine and boiler packing materials, including asbestos, are imported through the port of Rangoon, Burma, to the value of \$45,000 a year, reports Consul Moorhead at Rangoon. Great Britain supplies close to \$40,000 worth and the United States around \$3,000 worth. In 1914 the value of exports of these goods from the United States to Burma was inordinately swelled by one big shipment of rubber packing to a Rangoon oil company.

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

IN general the February market has been characterized by continued firmness due to shortage of supply. All advances have been retained with higher tendency. Manufacturers dependent on spot stocks are said to be paying almost prohibitive prices in some cases. Not many are thought to be so situated, especially among the larger buyers, as most wants have been anticipated.

ZINC OXIDE.

Contract deliveries are taking the bulk of the domestic output of zinc oxide into consumption and sellers have but little to offer. Stocks in second hands have been selling for 17 to 18 cents per pound. Producers claim that consumers who took supplies in the past are obtaining their usual amounts and even beyond that supply, as their requirements increased. The production of zinc oxide in this country is larger than ever before.

LITHOPONE.

Small lots of foreign lithopone are on the market, but arrivals are limited, and no sales have been noted under 14 cents per pound. Domestic lithopone sells at 13½ cents per pound. A large part of the production is sold ahead and this causes a strong situation in the spot market.

Samples of a French pigment have reached New York and the claim is made concerning the material that it serves many of the purposes of zinc oxide and lithopone.

LITHARGE.

There is a scarcity of stock in all lead products, causing reduced offerings and firm prices. Litharge has shown a fractional advance.

NAPHTHA.

The report of the investigation by the Bureau of Mines on the rise in prices of gasoline, has been made public by Secretary Lane. The upshot of the matter is that the consumption of gasoline as motor fuel is rapidly increasing and the production of crude oil has reached a maximum. It is stated that there are no world's figures available on the production and consumption of gasoline.

There is reason to anticipate still higher prices for gasoline which may ultimately affect the prices of proofed fabrics unless relief is found in a practical method of solvent recovery.

CAUSTIC SODA.

Prices have advanced during the month. It is stated that recent sales of about 1,000 tons have been made to France, Italy and other foreign countries.

PRICES OF CHEMICAL AND COMPOUNDING INGREDIENTS.

NEW YORK, FEBRUARY 29, 1916.

Subject to change without notice.

Acetone (drums)	lb.	\$0.42	@ \$0.44
Acid, acetic, 28 per cent (bbls.)	lb.	.06	@ .07
Alcali, 99% (carboys)	lb.	.50	@ .50
Aluminum Flake (carloads)	ton	18.00	@ 20.00
Ammonium carbonate	ton	108.50	@ 109.50
Antimony, crimson, sulphate of (casks)	lb.	.85	@ .90
Goldmine, golden, sulphate of (casks)	lb.	.65	@ .70
Asbestine	ton	19.00	@ 20.00
Asbestos	ton	.04	@ .05
Asphaltum "C" Brilliant	ton	120.00	@ 130.00
Barium sulphate, precipitated	ton	24.00	@ 27.50
Barytes, pure white	ton	23.00	@ 24.00
Basofo	ton	120.00	@ 130.00
Benzoil, pure	gal.	.85	@ .90
Beta-Naphthol	lb.	1.50	@ 3.00
Black Hips	lb.	.39	@ .40
Bone ash	lb.	.16	@ .17
Black	lb.	.035	@ .07
Cadmium tri-sulphate	ton	None	
Yellow	ton	None	
Cellulose gum	lb.	.275	@ .35
Carbon, bisulphide (drums)	gal.	.06	@ .15
Carbon, black (cases)	ton	.10	@ .15
Calcium chloride (drums)	ton	.16	@ .17
Caustic soda, 76 per cent (bbls.)	cent.	6.25	@ .05
Chalk, precipitated, extra light	lb.	.05	@ .05
Chalk, precipitated, heavy	lb.	.04	@ .05

China clay, domestic	ton	12.50	@ 20.50
Imported	ton	22.00	@ 40.00
Chrome, green	lb.	.30	@ .35
Yellow	gal.	.09	@ .55
Coal tar	lb.	.07	@ .12
Cotton linters	ton	70.00	@ .25
Emac	ton	37.50	@ 42.50
Gas black	lb.	.50	@ .52
Gilsonite	ton	.05	@ .06
Glycerine, C. P. (drums)	lb.	.50	@ .52
Graphite, flake (250 to 400 pound bbl.)	lb.	.05	@ .06
Lead, powdered (250 to 400 pound bbl.)	lb.	.60	@ .70
Green oxide of chromium (casks)	lb.	.03	@ .08 1/2
Ground glass	lb.	.07	@ .10
Indian red, reduced grades	ton	50.00	@ .01 1/2
pure	ton	60.00	@ .01 1/2
Infusorial earth, powdered	lb.	.02 1/2	@ .06
Iron oxide, red, reduced grades	lb.	.10	@ .15
Ivory, black	lb.	.05 1/2	@ .15
Lampblack	lb.	.03	@ .08 1/2
Lead, red oxide of	lb.	.06 1/2	@ .07
sublimed blue	lb.	.07	@ .07 1/2
white, basic carbonate	lb.	.06 1/2	@ .07 1/2
white, basic sulphate	lb.	.01	@ .01 1/2
Lime, flour	lb.	.08 1/2	@ .08 1/2
Litharge	lb.	None	
English	lb.	.11	@ .15
Lithopone, domestic	lb.	.11	@ .16
Imported	lb.	.08	@ .10
Magnesia, carbonate	lb.	.35	@ .40 1/2
calcined, heavy	ton	35.00	@ 60.00
Magnesite, calcined, powdered	ton	.03 1/2	@ .05
Mica, powdered	lb.	.26	@ .28 1/2
Mineral rubber	gal.	.21	@ .23
Naphtha, stove gasoline (steel bbls.)	gal.	.25	@ .27
66 @ 68 degrees	gal.	.21	@ .22
68 @ 70 degrees	gal.	.21	@ .22
V. M. & P.	gal.	.21	@ .22
Oil, aniline	lb.	.90	@ 1.00
linseed (bbl.)	gal.	.10	@ 1.04 1/2
pine	gal.	.60	@ .65
rapeseed	gal.	1.03	@ 1.12
rosin, heavy body	gal.	.32	@ .36
tar (cases)	gal.	.30	@ .31
soluble aniline colors, yellow, orange, red, violet, blue, green	3.00	@ 3.50	
Orange mineral, domestic	lb.	.10 1/2	@ .10 1/2
Paragol	lb.	.07 1/2	@ .07 1/2
Petroleum grease	gal.	.13	@ .17
Pine tar, retort	gal.	.44 1/2	@ .05 1/2
Pitch, burgundy	lb.	1.50	@ 1.70
Plaster of paris	lb.	1.50	@ 1.80
Prussian blue	lb.	.02	@ .03
Pumice stone, powdered (bbls.)	lb.	.12	@ .15
Resin, Pontianak, refined	lb.	.12	@ .15
granulated	lb.	.12	@ .15
fused	lb.	.12	@ .15
Rosin (280 pound bbls.)	lb.	5.50	@ 8.65
Rotten stone, powdered	lb.	.04	@ .04 1/2
Rubber black	lb.	None	
Rubber substitute, black	lb.	.07	@ .16
white	lb.	.09 1/2	@ .16
Shellac, fine orange	lb.	.25	@ .28
Soapstone, powdered	ton	10.00	@ 12.00
Starch, corn, powdered	lb.	.02 1/2	@ .02 1/2
Sulphur chloride (drums)	ton	.07	@ .15
Sulphur, flowers	cent.	2.30	@ 2.70
Sulphuric acid, 66	ton	.02 1/2	@ .02 1/2
Talc, American	ton	8.50	@ 13.00
French	ton	25.00	@ 30.00
Telul	ton	4.00	@ 4.50
Triphosphate earth, powdered	ton	50.00	@ .00
boiled	ton	60.00	@ .00
Turpentine, pure gum spirits	gal.	.58	@ .58
wood	gal.	.54	@ .54
Ultramarine, blue	lb.	.06	@ .35
Vermilion, brilliant	lb.	None	
Chinese	lb.	2.50	@ 3.00
English	lb.	3.50	@ 4.00
Wax, haberry	lb.	.47	@ .55
beeswax, white	lb.	.47	@ .55
ceresin, white	lb.	.14	@ .16
carnauba	lb.	.26	@ .47
ozokerite, blue	lb.	.50	@ .65
green	lb.	.65	@ .85
montan	lb.	.30	@ .32
paraffin, refined	lb.	.05 1/2	@ .05 1/2
133/125 m. p. (cases)	lb.	.07 1/2	@ .08
138/130 m. p. (cases)	lb.	.07 1/2	@ .08
133/136 m. p. (cases)	lb.	.06 1/2	@ .08
crude, white, 117/119 m. p. (bbls.)	lb.	.04 1/2	@ .08
yellow, 124-126 m. p. (bbls.)	lb.	.04 1/2	@ .08
Whiting, Alba	cent.	.45	@ .60
commenced	cent.	.55	@ .65
gliders	cent.	.65	@ .75
Paris white, American	cent.	.90	@ 1.25
English	cent.	.90	@ 1.25
Wind oil, XXX	lb.	.23	@ .28
Yellow ochre	lb.	.10	@ .15
Zinc anion process, horizontal brand	lb.	.09 1/2	@ .09 1/2
"special"	lb.	.09 1/2	@ .09 1/2
"XX red"	lb.	.16	@ .16 1/2
French process, green	lb.	.16	@ .16 1/2
red seal	lb.	.16	@ .16 1/2
white seal	lb.	.17	@ .17 1/2
Zinc oxide imported, white seal	lb.	.07 1/2	@ .14
Zinc sulphide, pure	lb.	.07 1/2	@ .14

MARKET FOR COTTON AND OTHER FABRICS.

EGYPTIAN COTTON

THE reports from Alexandria indicate very unsettled market conditions. The exchange is still closed and trading is wholly confined to individual operators. Speculation has been very active and the situation is temporarily in favor of the bull side of the market. Spot stocks of all available qualities are daily decreasing due to the active demand, and prices have advanced 6 cents since the first of February—26 cents being the quotation at this writing. The great difficulty surrounding cotton shipments from Alexandria is really the underlying cause of the present market disturbance.

SEA ISLAND COTTON

This market has been very strong during the month, largely due to the scarcity of Egyptians. The crop has nearly all been marketed—only crop lots remaining unsold for which there has been some demand on account of northern mills at 27 to 30 cents. The net receipts at southern shipping ports from August 1, 1915, to February 19, 1916, were, in round numbers, 67,000 bales, of which 47,000 bales were taken by northern mills.

COTTON DUCK.

There has been a marked demand during the month that has just passed, for 29-inch cotton duck for European account. Domestic business, as reported from various sources, is very good and consistently improving. Hose and mechanical duck are in active demand and the question of delivery is now the first consideration in buying orders. Balata belting duck has been noticeably active of late, contracts having been written for this material covering the balance of the year. The wide ducks are most active which has resulted in a scarcity of these stocks which in normal times are plentiful. This makes for higher prices on belting duck and accounts for the present advanced prices.

Prices on all ducks, drills and osnaburgs are very strong and indicate higher levels. Mills are working at full capacity on orders that bespeak active operations until October next. Spot stocks are not to be had with the exception of an occasional run over, and mill and warehouse stocks are the smallest in years.

TIRE FABRICS.

The domestic consumption of tire fabrics continues in increasing volume and suggests the possibility of demand exceeding production. The mills are exerting every effort to meet the situation with prompt deliveries, despite the besetting difficulties in securing raw materials, and the delays caused by continued labor troubles. The spindle capacity of the mills is taxed to the utmost and new equipment is difficult to obtain and install promptly.

Prices on all building fabrics have advanced 2 cents per square yard since our last report and there appears to be no reason to expect lower prices for some time.

The following are New York quotations on February 26, 1916:

(Subject to change without notice.)

Aeroplane and Balloon Fabrics:

Wamsutter, N. A. L. No. 1, 50 inch	.....	yard	\$0.22	@
Do. No. 2, 50 inch	.....	yard	.22	@
Do. No. 3, 50 inch	.....	yard	.12	@

Wool Stockinette—52 inch:

A-14-ounce	.....	yard	1.125	@
F-14-ounce	.....	yard	1.25	@
C-14-ounce	.....	yard	1.50	@

Cotton Stockinette—52 inch:

D-14-ounce	.....	yard	.49	@
E-11½-ounce	.....	yard	.39	@
F-14-ounce	.....	yard	.53	@
G-8-ounce	.....	yard	.43	@
H-11-ounce	.....	yard	.48	@
I-9-ounce	.....	yard	.405	@

Colors—white, black, blue, brown.

Tire Fabrics:

17½-ounce Sea Island, combed	.....	square yard	.77	@
17½-ounce Egyptian, combed	.....	square yard	.65	@

17½-ounce Egyptian, carded	.....	square yard	.57	@
17½-ounce Egyptian, carded	.....	square yard	.48	@

Sheeting:

40-inch 2.35-yard	.....	yard	.101	@
40-inch 2.5-yard	.....	yard	.09	@
40-inch 2.75-yard	.....	yard	.08	@
40-inch 2.85-yard	.....	yard	.073	@
40-inch 3.15-yard	.....	yard	.08	@

Osnaburgs:

40-inch 2.35-yard	.....	yard	.11	@
40-inch 2.48-yard	.....	yard	.101	@
37½-inch 2.48-yard	.....	yard	.103	@

Mechanical Ducks:

Hose	.....	yard	.17	@
Belting	.....	yard	.26	@

Carriage Cloth Duck:

38-inch 2.5-yard enameling duck	.....	yard	.13	@
38-inch 1.74-yard	.....	yard	.14	@
72-inch 16.66-ounce	.....	yard	.28	@
72-inch 17.21-ounce	.....	yard	.29	@

Drills:

38-inch 2.00-yard	.....	yard	.13	@
40-inch 2.47-yard	.....	yard	.105	@
52-inch 1.90-yard	.....	yard	.145	@
52-inch 1.93-yard	.....	yard	.12	@
60-inch 1.52-yard	.....	yard	.163	@

Yarns:

Garden Hose 12 2 cabled	.....	yard	.33	@
Fire Hose 12/1	.....	yard	.26	@

Imported Woollen Fabrics Specially Prepared for Rubberizing.

Plan and Fancies:

63-inch, 3¼ to 7½ ounces per square yard	.....	yard	.38	@
36-inch, 2½ to 5 ounces per square yard	.....	yard	.35	@

Plain 11mm:

63-inch, 2 to 4 ounces per square yard	.....	yard	.35	@
36-inch, 2 to 4 ounces per square yard	.....	yard	.20	@

Domestic Worsted Fabrics:

36-inch, 4½ to 8 ounces per square yard	.....	yard	.28	@
Ranocot Cloth	.....	yard	.06	@

Ranocot Cloth:

Ranocot Cloth	.....	yard	.06	@
Twills	.....	yard	.10	@
Tweed	.....	yard	.10	@
Tweed, printed	.....	yard	.06	@
Plaid	.....	yard	.06	@
Repp	.....	yard	.18	@

Burlaps:

32-7½-ounce	.....	100 yards	7.00	@
40-7½-ounce	.....	100 yards	7.65	@
40-8-ounce	.....	100 yards	7.75	@
40-10-ounce	.....	100 yards	11.35	@
40-10½-ounce	.....	100 yards	11.50	@
45-7½-ounce	.....	100 yards	9.15	@
45-8-ounce	.....	100 yards	9.25	@
48-10-ounce	.....	100 yards	15.00	@

CANADIAN IMPORTS OF COTTON FABRICS.

ARTICLES DESCRIBED	November, 1915.		Eight Months Ending November, 1915.	
	General Tariff Value	Preferential Tariff Value	General Tariff Value	Preferential Tariff Value
Stockinette for the manufacture of boots and shoes:				
From Great Britain	.....	.....	.....	\$1,217
United States	\$14,361	.....	\$58,679	.....
Totals	\$14,361	.....	\$58,679	\$1,217
Cotton duck, gray or white.				
N. O. P.:				
From Great Britain	.....	\$7,556	\$23,808	\$28,069
United States	\$25,688	.....	\$23,893	.....
Other countries	.....	.....	94	.....
Totals	\$25,688	\$7,556	\$23,812	\$28,069

ARTICLES FREE: Cotton or linen seamless duck, in circular form for use in hose pipe, was imported from the United States only, and amounted to \$15,950 for November, making a total of \$41,548 for the eight months ending November, 1915.



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RUBBER-TIRED AUTO TRAILERS.

An unexpected effect of the war now raging in Europe has been the bringing into evidence of the value of small rubber-tired automobile trailers. The tremendous number of wounded which the warring nations have been obliged to handle caused them to resort to these trailers for increasing the capacity of their motor ambulances.

Various types of trailers have been produced, but aside from the large ones with capacities of from 5 to 15 tons, they were nearly all made to order or the work of amateurs. Now the manufacture of trailers susceptible of being drawn by ordinary popular and low-priced touring cars and roadsters has been taken up on a commercial scale, and there are several American concerns offering rubber-tired trailers capable of carrying from 750 to 1,250 pounds, at prices that put them within the reach of those who are most interested in this economic and practical device for hauling freight by automobile. Now the small tradesman can hook a rubber-tired trailer to the back of his pleasure car and deliver substantial loads without soiling his machine.

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ever to the rubber manufacturer.
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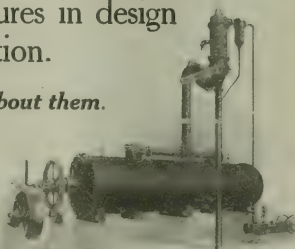
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PREPAREDNESS AND RUBBER.

THE mobilization of American industries for purposes of defence—this, on paper, is without doubt an excellent plan. It gives work for more commissions, shows us where we are weak and where strong, and guessing frankly, that is the end of it.

As for the ability of existing rubber plants to supply what our army and navy may need in peace or in war, that is easily gotten at. A competent government clerk with an able-bodied mimeograph could get the whole story in a week. The result would be the assurance that for the great essentials, rubber blankets, coats, boots, hospital supplies and tires, existing factories are fully prepared to swamp the war department at the very shortest notice.

Preparedness in manufactured rubber goods is solved. Not so, however, with crude rubber preparedness. Any eventuality that cuts off our supplies from

the Far East and from the Amazon would effectually stop the manufacture of all rubber goods. A commission to solve the problem of our supply of crude rubber, to report in favor of a government-owned supply of crude rubber sufficient to last a year, with another of rubber scrap to last two years, or a plant equipped to make 1,000 tons of synthetic rubber a day would be a heap more interesting. And who shall say that it would not be more practical?

THREE HUNDRED MILLIONS IN RUBBER.

THE preliminary report of the census of the rubber manufactures sent out the middle of last month gives some striking figures as to the magnitude of this important industry. It is a matter of congratulation that those in charge of the census adopted, at least in part, the suggestions offered by THE INDIA RUBBER WORLD in 1911. Previous census figures gave but three groups for this industry, namely: "belting and hose"; "rubber boots and shoes"; and "rubber goods not elsewhere specified."

It was suggested that it would be valuable to the trade, were separate figures given for automobile and cycle tires, solid tires, druggists' rubber sundries, hard rubber, reclaimed rubber, cements, coated fabrics (including mackintoshes, clothing, etc.), and dental and stamp rubber. While not all these suggestions were adopted, in place of the three headings, we have thirteen. Rubber tires, which hitherto were included in "goods not elsewhere specified" are now given the prominence their importance warrants, as nearly one-half the entire product of rubber manufactures. Separate totals are given for automobile casings, inner tubes, solid tires, and motorcycle, bicycle and aeroplane tires. Boots and shoes, belting, hose, packing, clothing, druggists' and stationers' supplies are the other divisions, after which comes "all other manufactures of rubber," and "all other products."

These latter divisions are most comprehensive. They probably include hard rubber (sheet and rod), battery jars, insulating apparatus, carriage cloth, dental rubber, stamp rubber, notions (such as dress shields, etc.), cements, shoe findings (soles, heels, inner soles, sole fillers, etc.), sporting goods, general mechanical goods (such as deckle straps, couch rolls, etc.), mats and matting, and brewers', plumbers' and bottlers' supplies. Undoubtedly manufacturers of these lines would like to have them separately enumerated, but perhaps this is asking too much, and we should be thankful that we are getting far more details this year than ever before.

The figures for insulated wire were given in the census of previous years, but are not separately given in this preliminary report. It is safe to say, however, that this branch of manufacture has grown proportionately, owing to the substitution of electric power

and consequent decreased use of belting. (The 1909 census figures are, \$51,625,000.)

Belting is given separately, but in previous years was grouped with hose. These two branches show but a fractional increase over 1909 figures, doubtless in part due to above-mentioned change in power transmission.

This is the first time scrap rubber and reclaimed rubber are given in the census reports. These materials are valued at over \$12,500,000. This reckoned at seven cents per pound, a very low average, would mean nearly 90,000 tons of scrap and reclaimed rubber, showing how important are these materials in the rubber industry.

In a report of the census of the industry taken in 1909, we compiled figures of the principal accessory industries, in which the rubber is used to a large extent. A similar calculation with such figures as are now available from the 1914 census, without adding insulated wire, brings the total beyond \$300,000,000. More than a million dollars each productive day of the year puts the rubber trade among the great industries of the country.

TIRE TEXTS.

THE beginnings of texts, or advertising catch phrases, for tires were in the early bicycle days when a simple rectangular card bore the legend "Morgan & Wright Tires Are Good Tires." This text on posters, letter-heads, catalogs and in advertisements was, in its way, a bit of genius.

It was most natural, therefore, that when the motor tire made its bid for popular approval, the alert minds that planned the selling campaigns should cast about for motor tire texts equally apt. One of the cleverest, "The Best In The Long Run," was also one of the first to appear. It was closely followed by "Time To Re-tire," a picture of a very sleepy youngster, giving the needed double entendre. Indeed, it is possible that the pleasant picture forestalled the pang that re-tiring costs the average motorist.

"Mightier Than The Road," has a certain oratorical flavor that is impressive. A captious critic might complain that, strictly speaking, roads do not possess might. It may also be suggested that American roads are mighty bad, but of course that is slang. "Made To Make Good" was well intentioned, but hardly euphonic. "Made To Make" hits one's sense of consecutiveness where it is particularly tender. "The Man With A Red Tire Knows" is a bit mystical, but not more so than its suggested alternate, "The Man With A Red Nose Tires." There are many more, all more or less clever, all doing their best. Be they praised or criticized, they are very difficult sentences to create. Further than this, whether praised or criticized, the end is attained,—attention is drawn to the special tire to which the text belongs.

THE PASSING OF THE DRY HEATER.

FROM the time of Leverett Candee to the present, rubber shoes have been made up, varnished and cured in one uniform, orthodox manner. Minor innovations such as sole-cutting machines and ten-roll calenders came in, to be sure, but in no way affected the established order of things. The rows of making-up tables with crowds of busy-fingered girls, the dripping varnish room, the cavernous dry heater, were integral parts of a system that was founded solidly on experience. No change was needed, none was imminent; nay, none seemed possible. Especially was this true of the curing. And yet almost in a day came the pressure cure and the most important part of rubber shoemaking was revolutionized. The question that at once obtrudes itself is, "Where will the innovation stop?" The mechanical goods manufacturers, the hard rubber men, the makers of druggists' sundries, have long been dominated by pressure in vulcanization, and their goods have been the better for it. And now that rubber shoes are pressure-cured, what of other goods of the dry heat kind? How about surface clothing, mackintoshes, carriage cloth? Is it a good guess that the pressure cure will in time enfold them, too, in its warm embrace?

THERE ARE SOMEWHAT GRAVE FEARS, BOTH IN GREAT Britain and in this country, that at the conclusion of the European war Germany will at once endeavor to regain its export trade by offering, in foreign markets, manufactured goods which have accumulated, either as such, or made from materials thus collected, at prices so low as to kill all competition.

In Great Britain an active movement has been started in favor of an anti-dumping law. In this country similar legislation has been agitated. Doubtless there are lines of industry which may be thus affected, but a perusal of "The Rubber Situation in Germany," as reported by our correspondent, on another page, will allay such fears, if any are entertained by manufacturers in the rubber trade. Germany has no such surplus. In fact, her manufacturers could find immediate use for thousands of tons of crude rubber, were they able to procure it. This industry, at least, can rest assured that there will be no post-bellum ruinous competition from Germany.

IT IS CERTAINLY GRATIFYING TO READ THE words of so able a man as Vice Chairman Hurley of the Federal Trade Commission in appreciation of the trade journal and the trade association, both of which he deems most important factors in the progress and prosperity of the trade. His address given on other pages in this issue, is worthy of careful perusal by manufacturers and business men. He points out some of the disadvantages under which American industries are laboring, advises conservation and co-operation, and outlines some of the work being done by the Government Commission, of which he is an important officer.

Pressure Cure of Rubber Footwear.

A RUBBER boot or shoe is made by assembling upon a form or last the various pieces of unvulcanized rubberized fabrics and sheeted stock which form the lining, stay pieces, exterior waterproof and wearing parts of the boot or shoe. This work is done by hand, and the thoroughness with which the tacky stock is made to adhere by the process of hand rolling has much to do with the length of service obtainable from the goods.

Boot and shoe making is generally done by piece work and hurriedly, therefore there are liable to be some small places in the goods where adhesion is imperfect and any air confined between the plies, prevents contact and weakens the structure.

Such faulty work may not always be discovered by inspection, and is liable to develop unlooked-for failures in service.

The usual method of curing rubber boots and shoes consists in exposing them on racks in large, dry heaters where the temperature of the air is slowly raised by steam circulating in coils beneath the racks. Moisture and volatile products escape by natural ventilation through openings in the roof of the heater. The air, a poor conductor of heat, circulates slowly and without pressure. The working conditions are therefore not under positive control, and the time of vulcanization is long, usually from eight to ten hours. The fact that the goods, during vulcanizing, are not under pressure permits the formation of blisters wherever included air or moisture is present. The loss from this cause is sometimes very considerable, and difficult to remedy. Other defects of the dry heater system of curing are irregularity of cure, due to faulty circulation of the air; excessive space required to handle the goods, because the cure is protracted unduly, and large cost for operation. Notwithstanding these defects and drawbacks, the dry heater has remained the standard method for curing footwear since the earliest days of rubber manufacturing.

The rubber boot and shoe industry is indebted to Hon. A. O. Bourn of Bristol, Rhode Island, for the introduction of the first practical process for the pressure cure of footwear, which he developed in his own works at Providence, R. I. Since his invention several others have been perfected, the work chiefly of American manufacturers. These methods of pressure cure mark the most important recent advance in the boot and shoe branch of the rubber industry, because they bring under control and obviate many of the troubles and inconveniences inherent in the older process of curing footwear.

Manufacturers are now able, by these inventions, to control the vulcanized process and produce better goods with fewer

"seconds." It is now possible to expel all air trapped between the plies in making, and under pressure to cure the shoe structure compactly together. Pressure cure, by direct steam, also allows the use of tough wearing and oil resisting mechanical stocks, such, for example, as automobile tire tread compound.

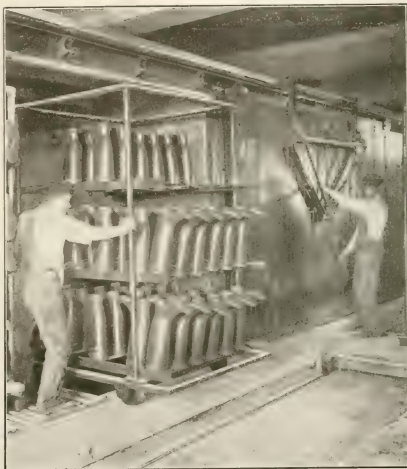
Other important advantages, due to these improved methods, are great economy of space formerly devoted to heaters, and a very important saving of time in vulcanizing. These points materially increase the curing capacity of a factory while the effectiveness of the process not only produces better goods, but permits the manufacture of boots and shoes of any desired color. This matter of freedom in color selection is an important one from a trade viewpoint, adding markedly to the variety and attractiveness of the goods.

No data are available for ascertaining the reduction in cost attributable to pressure cure, over open cure for footwear. Undeniably a favorable margin exists which makes it possible for the manufacturer to readjust qualities and values; a matter of first importance to the users of the goods. That such a readjustment does take place may be illustrated by the authentic account of a pair of pressure-cured boots worn by a certain car inspector. The story is to the effect that he subjected these boots to 26 months of actual service, or 760 days of wear, walking in this period 5,728 miles. The boots were provided with soles of tough automobile tire tread stock, but their endurance is justly credited, in part, to the compactness attained by reason of the pressure used in curing. Such wearing quality would not be expected from the best rubber boot vulcanized by the customary process.

In the manufacture of mechanical goods the standard methods of cure have commonly been pressure methods by steam heat, applied either in an atmosphere of steam or by steam heated molds. The patented processes of pressure cure for boots and shoes are adaptations of these means to the special conditions of footwear manufacture by evolving certain general methods for removing trapped air and curing the goods compactly.

These methods may be considered in three groups:

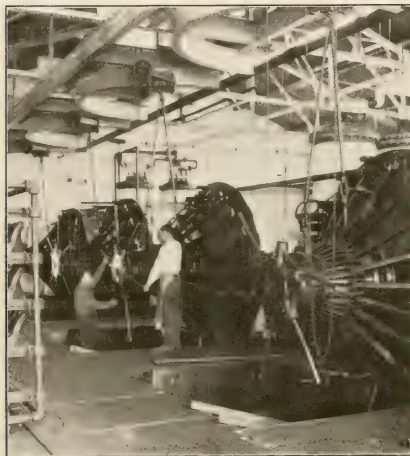
1. Consolidation of structure of the goods by pressure of air or non-oxidizing gases and the application of their heat or that of steam.
2. Removal by vacuum of entrapped air and vulcanization by pressure and heat applied by air, non-oxidizing gases or steam.
3. Compression of the goods by inflation or otherwise, in a mold heated internally or externally, by steam, for vulcanization.



REGULATION DRY HEATER FOR FOOTWEAR.

GROUP 1

1. **BOURN'S AMMONIA METHOD.**—By the evaporation of ammonium carbonate in a vulcanizing chamber adapted to retain pressure, an atmosphere is secured in which boots and shoes are cured in about three-quarters of an hour. The vulcanizing heat is derived from steam circulating in a jacketed space surrounding the curing table.



BATTERY OF PRESSURE PROCESS VULCANIZERS, CLOSED.

2. **BOURN'S COMPRESSED AIR METHOD.**—Compressed air in the curing chamber is employed to solidify the goods and to hasten vulcanization by its increased conductivity. Heat is supplied by steam circulating in a surrounding jacket.

3. **DUNCAN TOUSLEY METHOD.**—The goods, upon lasts, are sealed against the contact of air or steam. With this protection they are placed in a vulcanizing chamber which is hermetically closed. Air, heated to 280 degrees F., is introduced until the pressure reaches 60 pounds. The air is retained in the chamber about 45 minutes, until the goods attain approximately 270 degrees F. The air supply is then cut off and the confined air displaced by steam at about 80 pounds pressure. Vulcanization takes place in dry steam. At the completion of the process the steam is displaced by air to cool the goods before opening the vulcanizer.

4. **HILL'S METHOD.**—The goods, upon lasts, are vulcanized in an atmosphere of dry carbon dioxide maintained at any desired pressure up to 100 pounds per square inch. The walls of the vulcanizing chamber are heated by a steam jacket, and the interior of the vulcanizer by a steam coil.

5. **COCKBURN'S METHOD.**—An ordinary single or double-jacketed vulcanizer is employed in which the goods, on lasts, are placed and heated by dry steam in an atmosphere of compressed air.

6. **RUTHERFORD'S METHOD.**—The goods are made upon special lasts provided with ducts for the withdrawal of moisture from the shoes, and adapted for connection as part of a tubular frame car attachable to an air pump inlet in the shell of the vulcanizer. Thus connected the moisture can be withdrawn from the goods and vulcanization effected subject to the action of a controllable pressure.

GROUP 2

1. **WARNER'S METHOD.**—The goods, on lasts are placed in a vulcanizer which has been previously heated. By means of a vacuum, all the confined air and volatile gases are removed from the heated goods, after which a constant pressure of pre-heated air or inert gas replaces the vacuum during the period of vulcanization, and the required temperature is maintained until completion of the cure.

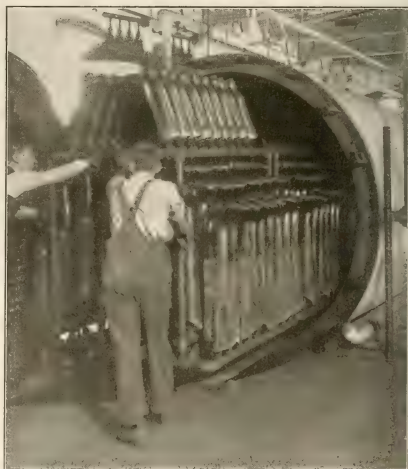
2. **CROWLEY'S METHOD.**—The goods are built on lasts adapted for attachment to a device for removing the trapped air or moisture. The goods may then be vulcanized by any suitable means, using hot air or gases with or without pressure.

3. **HILL'S METHOD.**—One of the objects of this process is the exclusion of the air from contact with the rubber during vulcanization, to avoid oxidation. To attain this, a thin, steam-tight, rubber-and-fabric envelope is provided to fit over the shoe and from this the air is removed, causing it to conform snugly to the contour of the shoe. It is then tightly sealed in that position. With each boot or shoe thus prepared, the goods are cured in an atmosphere of steam.

4. **PRICE'S METHOD.**—The shoe or boot is built up on a special last or boot tree with perforated walls and mounted so that the interior and exterior pressure conditions can be controlled, the interior pressure being less than the exterior pressure either before or during vulcanization, or both. By this means, air is removed from the materials and the structure of the goods. Hot air, hot gases or other means may be employed as the vulcanizing medium. The method also provides for pressure control in connection with the heating medium during vulcanization.

GROUP 3

1. **HIGGINS' METHOD.**—A special list is provided with an inflatable surface section and serves as a core for an internally



PRESSURE CURE VULCANIZER RECEIVING A CAR OF BOOTS.

steam-heated mold. Against the interior of this mold the shoe is compressed by air to solidify the plies of material.

2. **FIELD'S METHOD.**—The goods are compressed on metallic

lasts by enclosure in three-part separable molds, against the interior of which they are forced by an inflating pressure of air.

3. DOUGHTY'S METHOD.—This consists essentially of molding the goods upon a metal last or core in a three-part, steam-heated mold and exerting pressure on the rubber goods by mechanical means.

METHODS OF CONSOLIDATING FOOTWEAR PRIOR TO VULCANIZATION.

Two recent United States patents, having an indirect connection with the pressure cure of rubber footwear, should here be mentioned.

The object of both is to compact the structure of the goods by removing the wrinkles and interlaminated air, by fluid pressure, preliminary to vulcanization. The latter may be effected by any appropriate means. Both are improvements on the common hand roller process of making rubber shoes.

Randall's apparatus consists of a device for holding boots on lasts, under pressure in an adjustable, bell-shaped tank. A pressure of 90 to 100 pounds of air is exerted upon the unvulcanized goods. This effectively solidifies their structure,

expels all contained air, and secures perfect adhesion between the rubber plies and seams.

Piper's apparatus for a similar purpose is particularly adapted for the treatment of rubber shoes by either pneumatic or hydraulic pressure. It is a bench machine operated by the individual shoemaker and consists of a base plate to which is hinged a dome-like cover; the enclosed space is large enough to contain a rubber shoe on its last. The shoe rests on a diaphragm secured to the edges of the lower section of the base and is surrounded by another diaphragm similarly secured to the edges of the dome or cover section. These surrounding diaphragms have a combined internal contour approximating that of the last. The diaphragm arrangement is such that it is capable of handling a wide range of sizes and styles of shoes.

The process is essentially one of cold-molding the goods. Air or hydraulic pressure is admitted back of the upper and lower diaphragms which close snugly upon the shoe, compacting the plies of unvulcanized stock and expelling the air, which escapes between the edges of the shoe cavity. Subsequently the goods are vulcanized as usual by dry heat without pressure.

The Rubber Industry and the Census of 1914.

DIRECTOR S. L. Rogers of the Bureau of Census, Department of Commerce, has sent out a preliminary statement of that portion of the 1914 census of manufactures which refers to the rubber industry. This gives a somewhat detailed statement of the quantities and values of the various products manufactured, and is subject to such changes and corrections as may be found necessary from a further examination of the original reports.

The report is a summary of statements received from 331 establishments. The products of 23 of these establishments were rubber boots and shoes; of 18, rubber belting, hose, packing, etc.; and of 290, automobile tires or casings and inner tubes, motorcycle and bicycle tires, rubber clothing, druggists' and stationers' sundries, and other miscellaneous rubber goods. The products reported for 331 establishments for 1914 were valued at \$300,251,827. At the census of 1909, 267 establishments were reported, with products valued at \$197,394,638. The increase in value of products, therefore, was \$102,857,189, or 52.1 per cent. In addition, rubber products to the value of \$446,688 were reported in 1914 by 14 establishments engaged primarily in other lines of manufacture but which produced rubber goods as subsidiary products.

This report is, in some respects, far more satisfactory as regards details than similar reports of previous census years. In those reports but three divisions were made, namely: "belting and hose," "boots and shoes" and "rubber goods not elsewhere specified." The output of the tire business, which today represents nearly one-half the total value of manufactures of rubber, has been in former reports lumped with all other manufactures, except belting, hose and footwear. Therefore no exact comparison of the growth of this branch of the rubber industry is available, but it may be safely assumed that the increase of 52.1 per cent in the total annual output of rubber goods during the five-year period is accounted for in very large part by the enormous growth of this branch of the industry. There was reported the manufacture of 8,020,815 automobile tires or casings, valued at \$105,671,223; of 7,906,993 automobile inner tubes, valued at \$20,998,936; of solid tires for motor and other vehicles, to the value of \$13,735,681; and of 3,728,138 motorcycle, bicycle, and aeroplane

tires, valued at \$6,905,852. The total value of tires produced in 1914 was \$146,411,692, which was 48.8 per cent of the total value of all kinds of rubber goods produced.

Second in importance is the manufacture of rubber footwear. There were manufactured during the year 4,024,486 pairs of boots, and 57,211,728 pairs of shoes. These totaled in value \$50,506,156, which is rather disappointing when compared with the figures of the last decennial census which were 49,721,000. This comparison judged only by the figures, would indicate an almost entire absence of progress in the rubber footwear trade, but this industry is so dependent upon weather conditions that no one year is likely to give a fair and just estimate. The year 1914 was a comparatively light one, as regards rubber footwear trade. Had the census given 1915 figures, the comparison would have been more favorable, and more just.

Belting and hose were lumped together in the last decennial census, the amount reported produced in 1909 being \$24,729,000. The value of these in 1914 is placed at \$28,340,749. Packings were given as worth \$12,160,000 in 1909, and only \$3,507,651 in 1914.

The 1914 statistics are summarized as follows:

Number of establishments.....	331
Total value of products.....	\$300,251,827
Boots.....	4,024,486
Value.....	\$12,647,934
Shoes.....	57,211,728
Value.....	\$37,858,222
Tires.....	
Automobiles—	
Casings.....	8,020,815
Value.....	\$105,671,223
Inner tubes.....	7,906,993
Value.....	\$20,998,936
Solid, all kinds.....	13,735,681
Value.....	\$13,735,681
Motorcycle and bicycle (including aeroplane tires).....	
Number.....	3,728,138
Value.....	\$6,905,852
Belting.....	\$27,980,405
Hose.....	\$16,359,693
Packing.....	\$3,507,651
Clothing.....	\$6,396,810
Druggists' and stationers' sundries.....	\$7,327,755
All other manufactures of rubber.....	\$9,983,969
Scrap and old rubber (sold or on hand).....	\$1,297,487
Reclaimed rubber (sold or on hand).....	\$1,252,133
All other products.....	\$5,235,076

drafts against the letter of credit 12 days prior to their maturity in London, together with the banker's agreed commission; that they will insure the shipment for the banker's interest; that the title of the merchandise, bills of lading and insurance policies shall remain vested in the bank until all indebtedness is paid; that the bank is permitted to sell the merchandise for debt or for failure to supply security demanded in case the value of the merchandise falls; that the importer has the privilege of paying prior to maturity, interest being allowed at 1 per cent, under the Bank of England discount rate. The allowance of interest varies, and is a matter of agreement between banker and importer.

The letter of credit shown in Fig. 3 is issued and handed to the importer who in turn gives it to the representative of Wil-

SPECIMEN CREDIT *confirming cable*

Order No. *6743* *13600* ----- Trust Company -----
 New York, February 16th 1914

Miss William Smith & Co.
Singapore, Straits Settlements

London, for account of *Messrs John Jones & Co., New York*
 available by your drafts at 90 days' sight

Amount of *Cable transfer from New York to London*
 Insurance *including War risk effected in New York*

Bills of Lading for such shipments must be made out to the order of the ----- Trust Company
 indorsements specified on this credit.

CONSIGNEES IN THE WHOLE OF LONDON MUST BE SENT BY THE PAYEE, BY BANK NEGOTIATING
 DRAFTS, DIRECT TO THE ----- TRUST COMPANY ----- NEW YORK, FOR ADVISE TO
 TRUST COMPANY ----- LONDON.

The required cable transfer must accompany the drafts drawn on ----- Trust Company
 London.

The draft of each draft, negotiated, together with date of maturity, must be endorsed on back
 serial.

We hereby agree with bona-fide holders that all drafts drawn by virtue of this Credit, and in
 accordance with the above stipulations must be sent with the same upon presentation at the office of the
 ----- Trust Company ----- London if drawn and negotiated prior to *July 2nd 1916*

----- Trust Company -----

(Signed) J. C. S. Jones & Co. President
(Signed) John Doe - Manager

N. B. Drafts drawn under this credit must state
 that they are drawn under Letter of
 Credit No. *6743*
 dated *February 16th 1914*

FIG. 3.—LETTER OF CREDIT.

liam Smith & Co. of Singapore. Being a cable credit, the bank issuing it cables the essential particulars to its Singapore correspondent either directly or via London. The Singapore bank then notifies William Smith & Co. of the issuance of the credit and they are free to make drafts against it under the conditions set forth in the credit.

It might properly be noted here that the letter of credit costs William Smith & Co. nothing at the time of issue, the bank receiving as remuneration a percentage of the amount of the draft actually drawn against the credit. John Jones & Co. pay this commission when they settle for the draft.

William Smith & Co. in the meantime are arranging for the shipment of rubber, which may be sent in one or two regular ways, according to the terms of purchase. One method is "f. o. b.," meaning free on board, or "c. i. f." (often pronounced "Sif"), the abbreviation for cost, insurance and freight. Large importers find as a rule at the present time that they can make more satisfactory purchases on the f. o. b. basis.

With bottoms scarce and freight high, sellers are not particularly anxious to go to the extra trouble and expense of c. i. f.

shipments even if remunerated for the cost. If the terms are f. o. b. all the seller has to do is to make delivery to the dock, secure the necessary papers and get his money. As this rubber is sold f. o. b., the shipper on delivery of goods to the dock pro-

SPECIMEN DRAFT

Sirs,

London, 11th February 1916

Twenty days' sight of this Draft of Exchange
the draft being unpaid pay to the order of
----- Trust Company -----
London, E.C.

*Amount of *£1000**

*Pay to the order of *John Jones & Co.**
as advised
(Signed) William Smith & Co.

Second

Twenty days' sight of this Draft of Exchange
the draft being unpaid pay to the order of
----- Trust Company -----
London, E.C.

*Amount of *£1000**

*Pay to the order of *John Jones & Co.**
as advised
(Signed) William Smith & Co.

FIG. 4.—DRAFT.

cures steamer bill of lading showing consignment to the banker, and consular invoice from the American Consul.

He has nothing to do with the insurance in this case, because by the terms of the credit, insurance, including war risk, is to be effected in New York. Many New York importers place their own insurance in the form of a blanket policy or a special policy to cover each shipment, as they can usually obtain better rates here than in the Far East, being in close touch with both the New York and London companies.

All arrangements having been made, William Smith & Co. draw a draft in duplicate, as shown in Fig. 4 (without the "acceptance"), at 90 days' sight, and attach it to all documents, which are the consular invoice and all negotiable copies of the bill of lading, and if insurance is not covered in New York, the insurance policies or certificates, usually in duplicate.

Taking these to any local bank in Singapore that buys such drafts, the draft is sold at the prevailing rate of exchange for bankers' 90 days' sight drafts on London. The bank will, of

SPECIMEN ADVICE OF MATURITY

----- Trust Company -----
 New York, April 2nd 1914

to Messrs John Jones & Co., New York City

Dear Sirs:

We have received from our London Office the following advice of maturity for your account:

No.	Name of Vessel	Amount	Due at New York	Due at London	Remarks
<i>6743</i>	<i>Clary</i>	<i>£1000</i>	<i>June 11th 1914</i>	<i>June 26th</i>	

FIG. 5.—ADVICE OF MATURITY.

course, be particular to see that all documents conform in every particular with the terms of credit. William Smith & Co. thus receive their money, but neither John Jones & Co. nor the New

York bank have as yet advanced any payment in the transaction.

The bank at Singapore is required by the terms of the letter of credit to send one bill of lading together with consular invoice directly to the New York bank. The remaining documents, which include duplicate bills of lading and insurance certificate, if required, are attached to the original draft and sent forward to London by the Singapore bank.

As soon as the draft reaches the London correspondent of the Singapore bank its messenger takes it to the London branch of the New York bank, which accepts it by writing on the face the word "Accepted," the date of presentation and the date at which it matures, which is 93 days after the first presentation (three days of grace being allowed in London), and finally signing the acceptance officially. The London bank notifies its New York office of the amount of the draft and the date of its maturity, and forwards the shipping documents.

In the meantime the bill of lading and consular invoice have gone direct from Singapore to the New York bank, which holds them pending the arrival of the goods. On receipt of advice from London they advise John Jones & Co. of the date that the draft is due in London and also in New York. The form shown in Fig. 5 is used for this notification.

If John Jones & Co. should so desire, they may pay cash at any time before the draft is due and receive an allowance of interest, according to the agreement with the banker at time of issuance of the credit.

If this is not done the rubber is cleared and warehoused in the bank's name until the obligation is met.

By this method the importer is permitted to remove the rubber and sell it, but is bound to turn over immediately to the New York bank enough money coming from such sale or sales to pay the relative obligation to the bank. Furthermore the bank is privileged at any time to cancel the agreement and take over

SPECIMEN STATEMENT		New York, June 12 th 1916	
Messrs John Jones & Co., New York City			
To -----		Trust Company	
		Foreign Department	
U.S. \$ 6743	1763 1/2	4.82	8500 43
		plus 14 1/2 Comm	63 75
			8564 18
We charge your account.			

FIG. 7.—STATEMENT RENDERED.

the goods for which they have given their obligation. This trust agreement in no wise interferes with the obligation to meet the draft when due in New York.

The final form, illustrated in Fig. 7, is the statement rendered to John Jones & Co. on the date the draft is due in New York. The original amount drawn in Singapore is converted at the current selling rate of exchange for bankers' checks on London on the date the draft is due in New York. To this is added the commission, usually $\frac{1}{4}$ to $\frac{1}{2}$ of 1 per cent per month of the tenure of the draft. The total amount as shown by the statement is charged against John Jones & Co.'s account or they remit their check to the banker, and the transaction is ended.

This system of credits has been found to be a most logical and satisfactory way of financing imports, inasmuch as the importer has the assurance that the goods must be shipped before the seller receives payment, and the seller is sure of obtaining his money immediately on delivery of the goods to the steamship company.

The documents that are reproduced have been supplied through the courtesy of George Weston, manager of the Foreign Department of the Guaranty Trust Co. of New York, one of the largest and most prominent institutions in the commercial letter of credit business.

SPECIMEN TRUST RECEIPT

Received from THE ----- TRUST Co. ----- the following goods, and merchandise, their property, specified in the Bill of Lading per S.S. *Mercury*, Date, *Singapore, January 25th 1916* marked and numbered as follows.

WSC 1/70 *Security case, Grade Rubber*
JJC

and, in consideration thereof, [$\frac{1}{we}$] HEREBY AGREE TO HOLD SAID GOODS IN TRUST for them, and as their property, with liberty to sell the same for their account, and further agree, in case of sale to hand the proceeds to them to apply against the acceptance of THE ----- TRUST Co. ----- on [$\frac{my}{our}$] account, under the terms of the Letter of Credit No. *6743* issued for [$\frac{my}{our}$] account and for the payment of any other indebtedness of [$\frac{my}{our}$] to THE ----- TRUST Co.

THE ----- TRUST Co. ----- may at any time cancel this trust and take possession of said goods, or of the proceeds of sale of the same as may then have been sold, whenever the said goods or proceeds may then be found and in the event of any suspension, or failure, or assignment for the benefit of creditors, on [$\frac{my}{our}$] part, or of the non-fulfillment of any obligation, or of the non-payment at maturity of any acceptance made by [$\frac{my}{our}$] under said credit, or under any other credit issued by THE ----- TRUST Co. ----- [$\frac{my}{our}$] account or of any indebtedness on [$\frac{my}{our}$] part to them, all obligations, acceptances, indebtedness and liabilities whatsoever shall thereupon (with or without notice) mature and become due and payable. The said goods while in [$\frac{my}{our}$] hands shall be fully insured against loss by fire.

Dated, New York City *April 3rd 1916.*

(Signed)

John Jones & Co.

1763 1/2 Sig

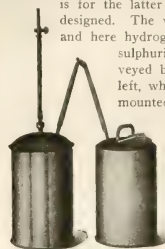
FIG. 6.—TRUST RECEIPT.

If the importer is of sufficiently good standing, the bank may permit the goods to be released on a trust receipt. One form of trust receipt is shown in Fig. 6.

MACHINE FOR INFLATING TOY BALLOONS.

Toy balloons are made by the dipped process, that is, the small pear-shaped form is dipped into a solution of rubber, after which the balloons are vulcanized and finally inflated. It

is for the latter process the apparatus here shown is designed. The vessel on the right is the generator, and here hydrogen gas is generated by the action of sulphuric acid upon zinc, this gas being conveyed by a rubber tube to the vessel on the left, which is the gas reservoir. This is surmounted by a pipe with a stop-cock. The neck of the balloon is pressed over the end of this tube, the stop-cock turned on, the balloon inflated, the stop-cock closed; then the neck of the balloon is tightly wound with strong thread, after which it is varnished in the usual manner. Two sizes are made, one for inflating 8 dozen balloons at each charge, and the other for 12 dozen balloons. [Brazel Novelty Manufacturing Co., Cincinnati, Ohio.]



The Trade Press and Our Present Problems of Business.

Extracts from a Notable Address by Edouard N. Hurley, Vice-Chairman, Federal Trade Commission, Before the New York Trade Press Association.

IT affords me great pleasure to address that branch of the Fourth Estate which speaks directly to, and for, the manufacturers and business men of our great country. The trade journal, as the complement of the trade association, is an instrument in enforcing that collective effort which is an essential of modern industry; while the trade press as a whole is a prime factor in establishing fraternity among all groups of business men, and thus uniting them in the common work of achieving and maintaining national prosperity.

PREPAREDNESS, TRADE AND MODERN METHODS.

Industrial preparedness, foreign trade, and more efficient methods of manufacture seem to be the most important questions before the American people today. You are vitally concerned. Your trade papers are devoting pages to the necessity of improving conditions in our factories, for the purpose of getting our share of the trade in manufactured goods that are sold in foreign markets. There is no question that your efforts will be productive of results.

I sometimes wonder if the efforts of your editorial writers, and your technical experts, are appreciated by the average manufacturer engaged in the industry which the trade paper represents. I do know that any manufacturer or employer who does not read the trade paper representing the industry in which he is engaged is not keeping abreast with the times. It is impossible for him to know what his competitors are doing; what new development is being made in the improvement of his product; what progress is being made in new inventions and designs; and the factory or company that does not have numerous trade journals scattered through its plant, so that employees may read them and keep well informed, is not a very progressive concern.

THE STARTING POINT IN PUBLICITY.

Progressive business men realize that trade-journal advertising produces results. If a manufacturer or business man will first start advertising in his trade journals, and become educated to the advantage of good copy—paying special attention, of course, to reaching his dealer—his next step, if his product will warrant it, is a national advertising campaign; but the first step is his trade journal or business magazine.

ASSOCIATION WORK.

Trade associations that are putting forth a special effort to improve their systems of cost accounting, bettering their processes of manufacture, obtaining credit information, and endeavoring to improve the welfare of their employees, will be important factors in our country's development in the next few years. It is recognized that individual groups which are working intelligently through trade associations and trade journals, will embrace the industries that can compete in price and quality in the markets of the world.

All of us are talking a great deal these days about mobilizing American resources. Mobilizing means simply organizing to achieve a common purpose. Many manufacturers seem prone to associate mobilization with expansion; and I venture to suggest that you gentlemen of the trade press profitably may devote some attention to the psychology of this error, with a view to getting the true situation indelibly impressed on the minds of the man of the business world.

EXPANSION BY EFFICIENCY.

I hope, now that our business has become normal and our factories are running on full time, that our manufacturers will place capacity ahead of expansion. I hope that, instead of rushing to build additions to their plants, they will ascertain that their present equipment has reached the maximum of day work, and then develop the night shift so that every piece of machinery will be working to its limit. We have an example of what American manufacturers can do along this line in the automobile industry.

We should get away from that old-fashioned notion that the night crew is lacking in efficiency, and that its workmanship is not up to the standard.

THE CAPACITY PROBLEM.

There has been over-anxiety to enlarge our industrial plants before we have worked our present equipment to its capacity.

Consequently, when there is depression in business in this country, we have an overproduction for our home requirements, and, with no large foreign markets for our surplus of manufactured goods, we immediately start to cut prices on the plea that such action is necessary in order to keep our large plants running. This always results in a general demoralization of our industries.

If we can stop this overproduction of our industries we will have a surplus of money to invest in foreign countries, instead of having millions tied up in plants that are running three days a week to supply our domestic market, with no returns on the investment.

TODAY'S INDUSTRIAL PROSPERITY.

With present business and profits holding through this year our industrial concerns will reach that commanding position which is given by great and ready cash resources. Among some of our larger concerns this position already has been attained. The United States Steel Corporation began the present year with \$105,000,000 in cash. This largest of our industrial companies never before reported cash holdings in excess of \$68,000,000. Other concerns, especially those engaged directly in war business, have immense cash holdings.

Our industrial concerns, in short, are fast getting into condition to finance greater business than ever before, not only at home but abroad. They are getting to be able to make contracts, say, with South American countries, on a basis never before possible to Americans, and to do it without arranging with bankers in special ways.

FOR FOREIGN TRADE EXPANSION.

One of the commanding holds upon foreign trade which the German dyestuffs manufacturers had, before the war set a barrier against them, was their immense power in working capital, which enabled them to extend credits and to conduct all sorts of aggressive campaigns to get world business. We are getting into position to profit from this example. You are vitally interested in presenting to the practical business men who read your papers, facts and suggestions that will aid in getting the greatest possible profit out of the situation that is developing.

There is no question more interesting to ponder, at this time, in considering the betterment of business conditions, than that of foreign trade. It is a most important question to our country. Our mines and forests, and our factories are turning out products for which there is a demand abroad, and it is not merely a question of increasing this demand, but the question of creating conditions that will enable us to get good prices for our wares, and produce them at the lowest possible cost, that should particularly command our attention.

Conservation is the handmaiden of prosperity so far as our foreign trade is concerned. Right here I want to emphasize the fact that the owners of our vast natural resources are the trustees of the American people. You gentlemen of the trade press should make it ring in their ears like a cathedral chime. When they sell their products at ridiculously low prices, the lumber, the copper and the coal that come from nature's storehouses—they are violating their trust, for ruinous trade spells a waste that brings nothing in exchange. Let me call your attention to a few facts pertaining to our foreign trade in its relation to natural resources, and to facts concerning the methods that are employed by some of our competitors in the commerce of the world, to prevent waste.

FOREIGNERS CONTROL AMERICAN PRICES.

Frankfort-on-the-Main is the home of a combination of German metal buyers who control the world market for copper, lead, zinc, and various other metals. It is a family affair, and has subsidiary companies in England, France, Belgium, Switzerland, Australia, Africa, Mexico, and the United States. It owns zinc mines in Oklahoma, smelters in Colorado, and controls one of the greatest metal trading companies in New York City. This giant organization, with its affiliations dominates the metal markets of the world. Time and again it has depressed the price of our copper. It is a notorious fact that it has compelled our producers to sell copper to foreign buyers at lower prices than to our home users. The combination has been able to do this in spite of the fact that this country sup-

plies two-thirds of the world's copper, and ought to set the prices, because it deals with our producers as individuals and plays one against the other.

We don't export much coal, but we sell a great deal to foreign ship-owners to bunker their vessels which call at our ports. At Newport News the Pocahontas and New River operators of West Virginia are dumping some of the finest coal in the world into foreign bunkers. The price is set for a year by a combination of English brokers. Last year it was \$3.30 per ton, but this year, in the face of rising labor costs, the combination was able to cut that price to \$3.10 because it could get certain mine operators to make low bids. When freight and other charges are deducted that nets \$1.38 to \$1.43 per ton at the mine, an average of 6 to 7 cents per ton under that charged our own manufacturers. And that advantage will be handed to foreign ship-owners on nearly 2,000,000 tons of West Virginia coal this year.

A LESSON IN CONSERVATION.

When conditions arise to threaten waste of the natural resources of our commercial rivals, prompt remedial measures are undertaken. Several years ago the German potash miners were competing between themselves and selling potash to foreign countries at a ridiculously low price. Finally they formed a cartel to regulate prices, and were encouraged by the German Government. After this cartel had been in existence for several years a difference of opinion developed and several members withdrew and started negotiations with American buyers for the sale of their potash. One of the largest opened up negotiations with Armour & Co., of Chicago, and a contract was made with this firm below the cartel prices. After the contract was sealed, signed and delivered, the German Government notified the independent potash producers that they would have to break the contract; that the prices quoted to Armour & Co. were too low; that while the individuals were the owners of the mine they were in reality the trustees for the German people, and that the selling of potash to American packers at the price quoted affected every man, woman and child in Germany; that when the potash was gone one of the most valuable resources for Germany's future was destroyed.

That is what Germany does with one of her natural resources. We have a precisely similar opportunity. Down in Tennessee and Florida, and out in the Rockies are the greatest known deposits of phosphate rock, a fertilizer material even more essential to general agriculture than is potash. We produce nearly half the world's output of phosphate rock, and 40 per cent of our production, made up of high grade, goes abroad, chiefly to Europe. Under normal conditions we send 1,000 tons to Germany every day of the year. Do we follow the wisdom of Germany, charging the prices we ought, and conserving our limited supply of this vital natural resource, so necessary to the future of our agriculture and the low cost of living here? You know the answer. We are selling the best we have as fast as we can at Europe's price.

There are many instances where foreign nations have taken governmental action to prevent waste of natural resources. Italy thus saved its sulphur industry in Sicily from ruin, threatened by overproduction and unbridled competition. Rumania has safeguarded its rich oil fields in the same way.

OUR DISADVANTAGE EITHER WAY.

The outstanding fact that confronts us is this: When we buy abroad we are at the mercy of the foreign seller, and when we sell abroad we are at the mercy of the foreign buyer. In the language of the street, they "get us a-comin' and a-go-in'." And the reason is that the European industries are organized scientifically to capture foreign trade and to get all there is out of it, while we in America have suffered the consequences of this one-sided organization.

Our method of disposing of our natural products, containing our valuable raw materials, and constituting the chief wealth of our country, should be stopped by the adoption of some practical, reasonable business method. For every dollar's worth of additional wealth that we receive for these products the people of the United States profit, and when we do not receive a fair price for the products that we ship abroad we are impoverishing our people, and our country is that much poorer.

AMERICA'S CHANCE AFTER THE WAR.

Competition is the same the world over, and it will be particularly keen when the business of peace is resumed among the nations. America's chance at the trade of the world will be helped beyond what it was before by reason of a new, even start with the others in the race, but we must be prepared to match systematized industry against the effective systematized

industries of our competitors. We must meet conditions as they exist.

In European countries manufacturers and merchants, aided by their governments, have developed a high state of efficiency, which enables them to sell their goods in the markets of the world. Our buyers, seeking raw and finished materials in foreign countries, who formerly had a free competitive field from which to receive bids, now find that the great manufacturing industries have been formed into combinations or cartels; and, instead of receiving bids from several concerns, the American buyers now have to do business with central selling agencies, each representing a whole industry. But when the foreign buyer seeks material here he finds our unsystematized market—much to his own satisfaction.

If the American manufacturer and merchant are forced to purchase their materials abroad at a higher price because of the elimination of the old competitive system, is it fair that our business men engaged in the foreign trade should be subjected to the ruinous features of the old system here at home? When the foreign buyer seeks material here he has hundreds of firms to bid on his order. When the first bid is received, back comes the cable: "Your price is too high." Then our business men start to cut prices in their endeavor to get the order, particularly if domestic business is dull. And so, instead of setting a fair price on his product and selling at a profit, the American business man takes what the foreign buyer dictates, frequently at an actual loss.

WORK OF THE FEDERAL TRADE COMMISSION.

The Federal Trade Commission will have a report ready in the next few weeks to submit to Congress showing further facts regarding our foreign trade conditions.

It is my belief that the time has arrived for some definite concrete action, and I feel confident that the sentiment is most favorable for some practical immediate relief.

Within the next few weeks the commission will mail to each corporation in the United States a letter and a list of questions, and the success of our efforts will in a measure depend upon you gentlemen. We are going to mail each trade paper in the United States a copy of this letter, as well as the questions, and we would like very much to have each trade paper endorse and urge the business men in their industry promptly to fill out the form and send it to the Federal Trade Commission. I wish particularly to call your attention to the fact that we are compiling this information for the business men engaged in every industry, and that our whole thought is to do the work in a manner that will be helpful to all.

A SERVICE TEST.

Electric storage battery jars must be made of an extremely tough compound to stand hard usage without breaking.

Storage batteries are now used by thousands of electric, pleasure and commercial vehicles. Storage batteries are hauling coal from the mines, lighting railway trains, operating railway switches and signals; indeed they are now used in every field of electrical development.

In the illustration an "Exide" hard rubber jar is shown supporting a 217-pound man, who holds a complete "Exide" baby battery of 48 pounds in his hands. This jar, while badly bent by the weight of 265 pounds, was not broken or cracked. It was taken from stock to demonstrate the extraordinary strength, toughness and flexibility of "Exide" hard rubber storage battery jars.—[The Electric Storage Battery Co., Philadelphia, Pennsylvania.]



Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

Machines For Making Bathing Caps.

THERE was a time when the bathing cap was plain and unattractive. Today it is made in a score of shades and shapes, and so beruffled and trimmed that it is a most attractive part of the bathing costume.

These changes have turned the old-time hand process work into a line of rubber manufacture for which a number of labor saving machines have been designed. The present day processes begin, of course, with the preparation of the stock.

First, latex plantation rubber is massed and mixed with the desired dry aniline color, be it yellow, orange, red, violet, blue or green.

It is here that the scarcity of imported dyes has seriously affected the industry. Most of the brilliant colors formerly came from

Germany, and are therefore not obtainable. However, satisfactory results are attained by proofing both sides of bright colored plaids, figured cowlings, taffetas and crepe de chins, with a transparent coating of pure rubber. Indeed, beautiful effects are thereby obtained, and it is further true that the colors will not run.

The rubber stock is next calendered and dusted with corn starch. It is then cut into 25-foot lengths, which are laid on a smooth surfaced shrinking table, one upon the other for a period of 48 hours. Whether the material from which the caps are to be made is calendered sheet or waterproofed cloth, the following methods of manufacture are practically identical in both cases.

The metal patterns for the bathing cap body are 18, 19 and 20 inches in diameter. When the shrinking is complete the pattern is laid on the sheet

and the body of the cap cut out by hand.

The edges of the cap body are then "hemmed." This operation is performed on an ordinary sewing machine, but without needle or thread, the hemming device simply folding over the edges of the cap body while the feed and the presser foot solidly unite them.

Up to this point the work has been with soft, uncured rubber that requires careful handling

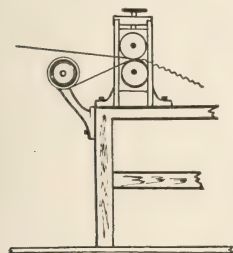


FIG. 2.—HEAD-BAND RUFFLING CALENDER.

as it is easily distorted and damaged, besides being sticky. As the operations that follow require a certain amount of firmness in the material, this quality is obtained by semi-curing the rubber in the rotary vapor vulcanizer shown in Figure 1. This is a box-like chamber heated by steam coils and enclosing a belt-

driven perforated wooden cylinder. In this the cap bodies are tumbled for an hour at a temperature of 110 degrees F., and exposed to monochloride of sulphur vapor, which effects a semi-cure.

Making the inside and outside head-band and the ruffled trimming that forms part of the latter is the next step to be considered. The unvulcanized sheet, that has been previously dusted with corn starch, is rolled on a mandrel, which is placed in a speed lathe, and the head-band strips are cut into separate rolls of the proper width. The edges of the band strips are folded by passing through metal folders. The lower strip forming the ruffled part of the outside head-band is wider than the upper one, and is unvulcanized, while the narrower, upper strip is semi-cured. In this position they are fed to the small 2-roll calender shown in Figure 2, meanwhile the operator pulls on the elastic upper strip, thereby ruffling the lower uncured strip as it passes between the rolls. The inside head-band is a plain strip of unvulcanized rubber about $\frac{7}{8}$ inch wide.

The cap is formed and the lower part pleated on a machine especially designed for this purpose. Before this is done the points of the pleats, where they will come in contact with the inside and outside head-band, are brushed with cement made

of pure rubber dissolved in naphtha, and allowed to thoroughly dry.

The next step in the operation is pleating, forming and assembling, which is done on the machine shown on Figure 3. The round semi-vulcanized and cemented cap body is placed evenly on the lower folding blades *A*. These are 36 in number, and arranged in circular form with their inner ends pivoted to the hollow plunger *B* that is reciprocated vertically by action of the treadle *C* and coil spring *D*. The inside head-band, which has been previously brushed with cement, is placed around

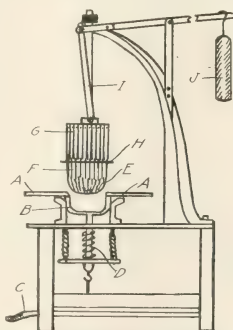


FIG. 4.—PLEATING AND FORMING MACHINE, CLOSED.

the head-block *E* and the ends joined, making the band endless. The upper pleating blades *F*, 36 in number, are arranged in circular form around the flange *G*, and turn on their vertical axes when the ring *H* is partly revolved. They also alternately register with the lower blades. The upper blades are then

lowered by depressing the vertical shaft *I*, controlled by the counter-weight *J*, until the blades are 3 inches below the inside cap-band that is attached to the head-block. The foot is then placed on the treadle, which lowers the hollow plunger and forces the lower pleating blades upward. These accurately fold the rubber sheet between the upper blades, and firmly attach each pleat to the inside head-band. The treadle is then released, allowing the lower blades to fall back and resume their original posture, as illustrated in Figure 4.

The cemented part of the cap has now been folded on and over each one of the upper blades, and cemented fast to the inside

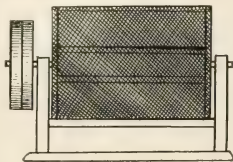


FIG. 5.—DRYING TUMBLER.

head-band. The ring to which the blades are attached is moved to the right, which simultaneously folds the pleats one upon the other, after which the blades are released by raising the upper blade-head. The outside head-band and trimming is then attached, and the cap and head-block are removed from the machine. An operator with ordinary intelligence and a little experience can turn out one complete cap a minute on this machine.

The final cure is then given, which is tumbling for 60 minutes at 110 degrees F. in monochloride of sulphur vapor in the vulcanizing chamber already described. The washing process which follows is performed in an ordinary rotary washing machine common in every steam laundry. Cold, clear water, with a small amount of 26 degrees liquid ammonia, and a pint of neutral chip soap serves to remove the corn-starch from the caps and restore the original brilliant colors. The final drying is done in a rotary octagon tumbler covered with open mesh wire cloth, as shown in Figure 5. About one hour's tumbling in this machine is sufficient to thoroughly dry the finished caps.

Foreign Import Duties on Rubber Tires.

THE following table, corrected to February 7, shows the foreign import duties on rubber tires of all descriptions imported into various countries from the United States.

The column marked "Weight" shows whether duties are levied on net or gross weight, or include simply the inner packings. The next two columns give the rate of the duty per 100 pounds in United States currency and the rate per cent ad valorem.

COUNTRIES.	Weight.	Rate per 100 Pounds, U. S. Currency.	Rate Per Cent—Ad Valorem.
NORTH AMERICA			
Canada			42.5
Central America			
British Honduras	Gross		15
Costa Rica: Port Limon	Gross	\$4.43	
Other ports	Gross	\$4.30	
Guatemala	Gross	\$7.21	
Honduras	Gross	\$4.86	
Nicaragua:			
Atlantic ports: Auto tires	Gross	\$3.81	
Solid tires	Gross	\$2.86	
Motorcycle tires	Gross	\$5.72	
Pacific ports—Auto tires	Gross	\$4.08	
Solid tires	Gross	\$2.99	
Motorcycle tires	Gross	\$12.25	
Panama			15
Salvador	Gross	\$13.65	
Mexico—Tires	Net	\$5.16	
Inner tubes	Net	\$3.53	
Newfoundland			49.5
West Indies			
British			
Antigua			13.33
Bahamas			25
Barbados			11.25
Boninca			12.5
Grenada			10
Jamaica			16.67
Montserrat			13.33
St. Christopher Nevis			11
St. Lucia			16.5
St. Vincent			15
Trinidad and Tobago			10
Turks and Caicos Islands			10
Virgin Islands			25
Cuba			
Danish:			
St. Croix			12.5
St. Thomas and St. John			6
Dominican Republic	Net	\$36.29	
Haiti			3
Haiti			29.1
SOUTH AMERICA			
Argentina—Tires and tubes		\$16.51	
Bolivia	Gross	\$36.29	
Brazil			\$16.71

In the last column are given many valuable notes regarding imports into particular countries.

Certain charges such as warehousing, customs handling, local taxes, revenue stamps, etc., are not included. The rates of duty shown, including the surtaxes as noted, should therefore be regarded as the minima. As changes in duties are liable to occur at any time, frequent verification of these figures is advised.

Remarks.
{ Imports of articles invoiced at prices less than the market value in the country from which exported, are liable to a "dumping" duty of 5 per cent if such articles are also made in Canada.
In addition, there is a wharfage tax of 10.5 cents per 100 pounds.
A surtax of 18.6 per cent is included.
{ A surtax of 10 per cent is included. The value of the Mexican peso, used in getting the converted value, was \$0.156.
A surtax of 10 per cent is included.
Cost of packing is excluded.
A surtax of 10 per cent is included.
Cost of packing is excluded.
A surtax of 10 per cent is included.
A surtax of 20 per cent is included.
Duty, based on invoice price, increased 25 per cent.
Duty, based on price F. O. B. at port of export.
{ A surtax of 94.53 per cent is included. The duty was based on the import price + 10 per cent to allow for freight and insurance.
{ Weight includes inner packing. Automobile tires only. A surtax of 2 per cent is included.
{ A surtax of 15 per cent and also a statistical tax of one-tenth of 1 per cent of the valuation are included.
{ A surtax of 2 per cent is included. The conversion into U. S. currency is made on the basis of \$2.45 to the milreis.

COUNTRIES.	Weight.	Rate per 100 Pounds.	Rate Per Cent.—	Remarks.
		U. S. Currency.	Ad Valorem.	
SOUTH AMERICA:				
British Guiana		18.15		A 5 per cent surtax is included in the rate, but for articles subject to specific duties only, 5 per cent surtax is added, making the rate 17.13 per cent.
Chile—Pneumatic tires		\$39.74		Including inner packing.
Solid tires		\$19.87		Including inner packing.
Colombia	Gross	\$0.93		A surtax of 2 per cent is included. Articles imported by way of Buenaventura and Guapi pay only 95 per cent of the duty, while those imported through Tumaco pay only 70 per cent of the duty during 1916.
Ecuador		\$9.96		A surtax of 12.5 per cent is included and the weight includes inner packing.
Paraguay		\$36.77		Automobile tires only. A surtax of 7 per cent is included.
Peru—Automobile tires	Gross	\$24.28		A surtax of 10 per cent is included at ports of Callao, Salaverry, Paita and Pisco, other ports only 8 per cent (\$35.76).
Other tires		\$36.42		A surtax of 8.5 per cent is included, but the license fee of 15 per cent and the statistical tax of .35 per cent of the valuation of all goods are not included.
Uruguay	Gross	39.5		A surtax of 56.55 per cent is included.
Venezuela	Gross	\$10.28		
EUROPE:				
Austria-Hungary	Net	\$13.81		
Belgium—Solid tires	Net	\$5.69		Casings only.
Auto tires	Net	\$10.16		
Inner tubes	Net	\$14.88		
Bulgaria—Tires and tubes	Net	\$5.25		A surtax of 20 per cent is included.
Denmark—Auto tires	Net	\$6.08		
Solid tires	Net	Free		
Finland	Net	\$9.55		
France—Auto tires and tubes	Net	\$13.13		A surtax of 3 per cent is included. Casings only.
Motorcycle tires	Net	\$21.89		
Germany	Net	\$6.48		
Greece	Net	\$1.03		(This duty is exclusive of the 4 per cent tax which the various municipalities are authorized to impose.
Iceland		\$0.24		
Italy—Tires and tubes	Net	\$5.25		
Netherlands		5		
Norway	Net	\$3.65		Casings only.
Portugal	Net	\$2.13		Conversion to U. S. currency is based on the average quotation of the paper milreis for July 1914.
Roumania		\$9.06		Weight includes inner packing. A tax of .5 per cent is included.
Russia	Net	\$32.09		Automobile tires only.
Serbia	Net	\$10.51		
Spain—Solid tires	Net	\$17.51		
Casings and inner tubes	Net	\$23.64		
Sweden—Auto tires	Net	\$14.59		
Solid tires	Net	\$9.73		
Switzerland	Gross	\$0.70		
Turkey		30		
United Kingdom		33.33		
ASIA:				
British—				
Ceylon		5.5		(The basis of this duty is the wholesale cash price in bond, less trade discount at the port of entry.
Federated Malay States		Free		
Hongkong		Free		See note for Ceylon.
India		5		
Straits Settlements		Free		
China		5		
Chosen (Korea)		8		
Dutch East Indies		10		
French Indo-China	Net	\$13.13		Automobile tires only.
Japan (including Formosa)	Net	25		
Persia		10		
Siam		3		
AFRICA:				
Abysinia		10		
Belgian Congo		10		
British—				
Mauritius		12		Duties are collected on the current import value.
Nigeria		Free		Duties are based on the fair market value of the goods in the country from which exported.
Union of South Africa	Gross	15		Duties are based on the current value for home consumption at the place of purchase, including value of packing and the agent's commission if it exceeds 5 per cent.
Zanzibar		7.5		The dutiable value of imports is taken to be the cost price with charges, increased by 5 per cent or the invoice price without charges, increased by 15 per cent.
Egypt		8		At Alexandria an additional tax of .5 per cent is added, while different additional taxes are imposed at other ports.
French Algeria	Net	\$13.13		
Italian—				
Eritrea		8		
Libia		11		
Somaliland		15		
Liberia		12.5		
Morocco		12.5		
OCEANIA:				
Australia		25		Duties are based on fair market value F. O. B. at port of export, plus 10 per cent. On casings weighing over 2½ pounds and inner tubes over 1 pound each, 36 cents per pound, if higher than the ad valorem rate.
Philippine Islands		Free		Imports of foreign origin are taxed 25 per cent of their value.
New Zealand		1		Duties are based on the fair market value of the goods in the country from which exported.
Tutula		10		

What the Rubber Chemists Are Doing.

EXPERIMENTS IN VULCANIZATION.

NITROGEN and the rate of vulcanization of rubber has been studied by J. Grantham, who presents his results in the "Agricultural Bulletin" of the Federated Malay States (October, 1915). The investigation was conducted on several slices of smoked and unsmoked plantation rubbers representing conditions of standard practice in the preparation of rubber from its latex.

Although there is a wide difference in rate of vulcanization between smoked slab and smoked sheet, no difference is noticeable in the nitrogen content. Comparison of the unsmoked sheet and unsmoked slab showed that low nitrogen is connected with rapidity of vulcanization.

These observations were confirmed by a second series of experiments which yielded the following results:

Type of Rubber.	Percentage of Nitrogen.	Optimum Time of Vulcanization in Hours.
Thick smoked slab.....	.425	1½
Thin smoked slab.....	.398	1¼
Thick smoked sheet.....	.400	2½
Thin smoked sheet.....	.416	3
Thick unsmoked slab.....	.210	1¼
Thin unsmoked slab.....	.352	1½
Thick unsmoked sheet.....	.386	2½
Thin unsmoked sheet.....	.394	3

All estimates were made on the crêpe prepared prior to vulcanization. Again no relation can be traced between the nitrogen content and rate of vulcanization in the smoked rubber, and the differences are probably experimental errors. The unsmoked rubbers, however, show a regularly increasing percentage of nitrogen, with a decreasing rapidity of vulcanization. The increase is not regular, however, the difference in nitrogen percentage between the two unsmoked slabs being much the greatest.

The loss of nitrogen in the unsmoked rubber is probably due to decomposition of the protein, and the rapidity of vulcanization appears to be associated with this decomposition. As far as the author is aware this relation between rapidity of cure and low nitrogen content has not been recorded before, probably on account of the predominance of smoked rubbers and crêpes on the market, in which the relation is not apparent. Smoking has the effect of preventing the loss of nitrogen. It does not, however, prevent a slab rubber developing a rapid rate of vulcanization since the smoked slab cures in 1½ hours. Hence it cannot be the actual loss of nitrogen which produces rapidity of vulcanization.

Experiments to determine at what stage in the preparation of slab rubber the nitrogen is lost showed that a large loss occurs when the slab is crêped previous to vulcanization. It also appeared that most of this nitrogen is in such a form in unsmoked slab that it is lost in the gaseous form when heated to 212 degrees F.

Other experiments were carried out with fresh coagulum. These showed a large loss of nitrogen during the drying of the slab. This is accounted for partly by the loss in the serum which drains away, and partly by the loss in the gaseous form due to decomposition.

The author summarizes his results as follows:

In smoked rubbers from the same latex the nitrogen content is constant, although the rate of vulcanization varies considerably between slab and sheet. Smoking appears to fix the nitrogen.

In unsmoked rubbers from the same latex there is considerable

variation in the nitrogen content of the rubber after crêping preparatory to the vulcanization process. It is small in the case of rapidly vulcanizing rubbers, and larger in that of the more slowly vulcanizing ones.

The low percentage of nitrogen in rubber prepared as unsmoked slab is attributed partly to loss in the gaseous form during the superficial drying of the slab, and partly to the washing out of nitrogenous decomposition products when the slab is crêped prior to vulcanization.

Since rapidly vulcanizing smoked slab rubber contains as high percentage of nitrogen as slowly vulcanizing sheets, the actual loss of nitrogen cannot be the cause of rapidity of vulcanization, although it would appear from the results of the unsmoked rubbers that rapidity of vulcanization and loss of nitrogen are in some way associated.

SYNTHETIC RUBBER AND SAWDUST.

In a recent number of "Le Caoutchouc & la Gutta Percha," G. Noyer reviews the work of Harries and other investigators on the relation between levulic acid and rubber, and the value of sawdust as a source of levulic acid. Harries has shown that the ozonide of rubber yields levulic acid by the action of water.

No satisfactory source has yet been discovered that will yield levulic acid in abundant quantity and at low cost. The author considers it possible that an abundant cheap source of levulic acid may be found in sawdust, and that the alcohol to be derived would pay the cost of treatment. It has been estimated that a ton of sawdust will give by Simoussen's method, dilute sulphuric acid at 8 atmospheres, 250 kilos of levulic acid.

It is possible from levulic acid to derive isoprene; consequently it will furnish a synthetic rubber identical with natural rubber, and not one with unknown properties.

VULCANIZING EXPERIMENTS.

Eaton and Grantham have shown (THE INDIA RUBBER WORLD, March, 1916, page 289) how a particular method, which normally produces a uniform rubber with a very slow rate of cure and inferior mechanical properties, can be altered so that a rapidly curing rubber may be obtained possessing considerably superior physical properties after vulcanization, equal in fact to the best samples of First latex rubbers. This is accomplished by allowing the coagulum to remain for about ten days before it undergoes the usual procedure for conversion into block. Experimental results show that the rate of cure increases till the sixth day, after which little or no change takes place. It has been established that it is perfectly safe to crêpe the slab after ten days, since the change causing maximum rate of cure is effected during this period. Examination of several old samples of slab rubber indicate that the substance causing this acceleration in rate of cure does not apparently decrease.

DETERMINING PROTEINS IN RUBBER.

A convenient method for the separation of the nitrogenous bodies contained in rubber has been perfected by Spence and Kratz.

A solution of rubber in benzene, chloroform or toluene when treated with acid loses viscosity. The decrease may reduce the viscosity to that of the solvent. At the same time the insoluble nitrogenous compounds in the rubber are precipitated and readily separated. The reaction is hastened by sunlight or heat. The method has been applied to determinations on plantation and hard cure Para rubber. The results appear to demonstrate that the insoluble nitrogenous residue found in rubber is not pure protein, but a complex of protein and carbohydrate, probably a gluco-protein. The work of Spence and Kratz indicates

that the correct factor for calculating the protein content of plantation and wild Para rubber is 10 rather than 6.25, which has previously been taken.

The process of isolating the nitrogenous composites of rubber also permits their further study and analysis.

The details of the method are thus stated: 100 grams of washed and dried rubber are treated with 1,000 cc. of benzene containing from 0.3 to 0.5 per cent of trichloroacetic acid. The mixture is exposed to sunlight or heated in a vessel immersed in boiling water and thoroughly shaken at intervals. After 48 hours the solution is allowed to settle and the clear liquid decanted. The insoluble is subjected to two extractions, 500 cc. each, of the mixture of benzene and trichloroacetic acid. The residue is washed with pure benzene, dried, powdered and again extracted with benzene. Following this it is washed with alcohol, dried and weighed.

THE STRUCTURE OF RUBBER.

In "Le Caoutchouc & la Gutta Percha" (February 15, 1916) André Dubosc discusses at length the various theories of the structure of the rubber molecule and its attachments in the complex rubber agglomerate. The author recognizes the extreme difficulty of the problem, and reviews impartially the work of the eminent chemists who have investigated the subject. He presents a concise discussion of the leading theories, as analyzed by the Russian chemist Koudhakow, and sustains the theory of Barrow as the best thus far advanced.

Barrow holds that no formula of the constitution of rubber can be admitted unless it is compatible with the following experimentally demonstrated facts:

1. Rubber gives, by action of ozone, an ozonide which results from the addition of O^2 to a product of depolymerization.
2. Rubber, treated with bromine, gives a tetra bromide, which is an addition product.
3. Rubber, heated in high boiling point solvent, depolymerizes, not to a cyclooctadiene, but to dipentene containing a cycle in C^8 .
4. Rubber subjected to pyrogenation gives a series of products of decomposition.
5. Rubber, by hydrogenation, changes into a saturated carbide.
6. Rubber can be obtained by polymerization from isoprene, whereas the dipentene does not give rubber.
7. Rubber, left to itself, passes by a superior degree of polymerization, this process being reversible.
8. A small quantity of sulphur is sufficient for complete vulcanization.

Barrow proposes a very ingenious formula, which practically harmonizes the ideas of Harries and Pickles. This he has done by the conception of a spiral formula for the rubber complex, with double connections mutually saturated. The diagrams (here omitted) show that such a spiral molecule would be in close relation with that of the cyclooctadiene, since the double connections are in the same situation.

Harries' formula explains the rubber molecule, but is vague regarding complex or polymerized rubber.

Barrow's spiral formula scheme supplements Harries' theory by uniting and explaining the reactions that have been experimentally noted concerning rubber, and gives the best idea of what the structure of rubber may be, notwithstanding certain obscure points and the difficulty of comprehension that the scheme involves.

ACETONE SUBSTITUTE.

Solvent mixtures containing ethyl alcohol, ethyl acetate and formic ethers have been proposed in place of acetone for the treatment of resinous rubbers by extraction. The presence of a large amount, 40 per cent, of ethyl acetate in such a solvent serves to hold considerable of the rubber in solution. This action is aided by the heat, which increases the reaction of the acetic and formic ethers upon the rubber. The solution thus

formed can only be precipitated by the addition of a large quantity of ethyl alcohol.

The use of such acetone substitutes is not economical, and can not be recommended. (G. Noyer in "Le Caoutchouc & la Gutta Percha.")

A NEW METHOD OF COAGULATION.

Eaton and Grantham, chemists of the department of agriculture of the Federated Malay States, have published in the "Bulletin" (November, 1915) an account of their experiments on the coagulation of Hevea latex and a new method of coagulation:

"If Hevea latex be allowed to stand in open vessels, the amount of coagulation depends on the shape of the vessel and the depth of the latex. A thin layer of latex does not coagulate, but changes to a peculiar slime with a yellow surface scum. If latex be placed in tall cylinders, coagulation is much more complete and the slime formation is much less, constituting only a small depth of the latex near the surface. The surface scum is also found to be alkaline in character, and the scum below acid, showing two distinct processes of decomposition. This is the basis of the so-called "anaerobic" process of coagulation for which a patent has been taken out in the Federated Malay States. This process may thus be explained by a bacterial theory. The conditions are such as to inhibit a large number of bacterial species, including most of the putrefactive ones, while other species, including the coagulating ones, free from the competition of purely aerobic species, are encouraged. To find an explanation on the enzymic hypothesis is more difficult. We have since found that coagulation under these conditions is variable, on some days the coagulation being complete and on other days not quite complete, indicating a variable factor in the latex itself."

A series of experiments was conducted in which the effect of putrefactive and non-putrefactive changes in the latex was studied. Treating latex with various antiseptics and heat delayed or prevented coagulation.

The authors summarize their experimental results as follows: "These experiments indicate a possible explanation of the natural coagulation of the latex of *Hevea Brasiliensis*, viz.: That it is due to certain bacteria which infect the latex after collection.

"There are two distinct types of organisms, one favored by aerobic conditions, which tends to inhibit coagulation and produces an alkaline slime in the presence of air, and the other favored by anaerobic conditions which affect the coagulation of the latex.

"The coagulation of latex under anaerobic conditions is not constant; on some days complete coagulation occurring, and on other days being much less complete, possibly due to a variation in the constituents of the latex.

"By the addition of various sugars, coagulation under both aerobic and anaerobic conditions always occurs, and is caused, in our opinion, by the fact that a medium is formed more favorable for the organisms which produce coagulation, and less favorable to those producing putrefactive changes."

ANALYTIC METHOD.

DETERMINATION OF TOTAL CHLORINE IN RUBBER SUBSTITUTE.—The method of A. Hutin is as follows: From 0.2 to 0.5 grams of the substitute is covered in a porcelain crucible with the usual mixture of sodium carbonate and potassium nitrate. The mixture is heated slowly to quiet fusion. When cold the melt is dissolved in water to which nitric acid has been added, and the chlorine determined by titration.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

CHEMICAL TREATMENT OF RUBBER.

THE UNITED STATES.

RESTORING RUBBER. United States patent No. 1,172,158. Frederick Moench. The process consists in heating the vulcanized old rubber waste in a closed retort out of contact with the air, while enveloped with a plastic mixture containing linseed oil, turpentine and an earthy material.

RUBBER LEATHER SUBSTITUTE. United States patent No. 1,174,734. Benjamin Kepner. The process comprises treating a fabric with a solution composed of glycerin, gelatin, an oil and tannin, and thereafter drying the fabric in sunlight at a temperature not over 120 degrees F. The softness and flexibility of the product is increased by treatment with water and applying oil to the surface of the goods.

VULCANIZABLE SUBSTITUTE FOR LEATHER AND RUBBER.—United States Patent No. 1,174,967, John Stewart Campbell. The process consists in cooking a mixture of finely divided leather and animal fats or fatty oils with caustic alkali, adding fibrous material, magnesia, a filling material, and solution of elastic gum during progress of the boiling of the mass. After removal from the boiler the mass is dried and milled on rollers, with the addition of a vulcanizing agent. The product is formed into sheets and subjected to a vulcanizing operation.

THE UNITED KINGDOM.

COAGULATION OF LATEX. 22,138 (1914), S. C. Davidson. Rubber latex is coagulated by adding an "alkalized" cresol, cresylic acid or higher tar acids, or other "alkalized" phenoloid, and an aqueous solution of a thiosulphate, sulphite or other compound capable of evolving sulphurous acid on treatment with acid or acid substance, and finally coagulating by adding an acid or acid substance to liberate the preservative substance in the phenoloid, and also to liberate sulphurous acid. (Compare United States patent No. 1,145,351 and 1,146,851, THE INDIA RUBBER WORLD, September, 1915, page 648.)

TRADE PUBLICATIONS ON LABORATORY APPARATUS AND SUPPLIES.

GENERAL LABORATORY APPARATUS AND SUPPLIES. Lenz & Naumann, Inc., New York City. This is a new well-indexed catalog of 499 pages, in which all the well-known standard apparatus, as well as many specialties are illustrated and described. The lines carried include chemical, medical, surgical and physical apparatus, glassware, specialties and chemicals.

VITROSIL. The Thermal Syndicate, New York City. Pure fused silica in numerous forms of tubes, plates, dishes, etc., designed for laboratory purposes.

CENTRIFUGES. International Instrument Co., Cambridge, Mass. An extensive line of centrifuges and other apparatus, including Kjeldahl racks and bottle shakers for analytic work.

ALUMINUM CRUCIBLES. Norton Co., Worcester, Massachusetts, manufacturers of combustion boats, filtering covers and disks, electric laboratory furnaces, etc.

OPTICAL INSTRUMENTS FOR INSPECTION AND TESTING OF MATERIALS. Bausch & Lomb Optical Co., Rochester, New York. Microscopes and accessories.

MEASUREMENT OF CONDUCTIVITY OF ELECTROLYTES. Catalog 48. The Leeds & Northrup Co., Philadelphia, Pennsylvania.

BULLETIN 12. Hoskins Manufacturing Co., Detroit, Michigan. Electric furnaces, pyrometers and hot plates.

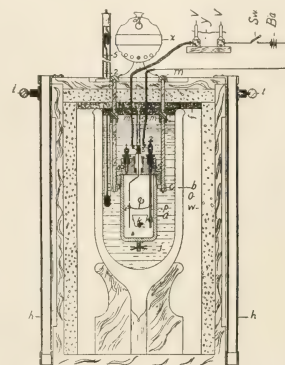
LABORATORY APPARATUS.

AN IMPROVED CALORIMETER.

CALORIMETERS for industrial laboratory use are not usually adiabatic, permitting an appreciable loss or gain of heat because of relatively imperfect insulations, which fail to prevent the interchange of outside and inside temperatures.

The Riche calorimeter is so free from complicated details that it is said a person with only ordinary mechanical knowledge of the principles can carry out perfect determinations with it in half the time required by other calorimeters.

This instrument is encased in a cork-lined cabinet of wood, and equipped with electrical



means for igniting the material being tested. The special feature which should be noted is that a glass vacuum cup is used to contain the water and bomb. By this arrangement the entire heat of combustion is confined for a period of at least one-half hour.

The bomb is a two-valve, porcelain-lined type, guaranteed for 3,000 determinations, but with proper care good for 8,000 or more combustions, the two-valve arrangement allowing for carbon dioxide determinations. Any style of bomb, however, may be used in this calorimeter. [Lenz & Naumann, Inc., New York City.]

DEVICE FOR READING BURETTES.

A simple and effective device for reading burettes is thus described by R. S. Poindexter:

Take a piece of white rubber tubing 5 cm. long, and of a diameter of about one-half that of the burette. Slit it down one side, open it out, and with a ruling pen and black ink make a 1 mm. line down the center.

When placed on the burette it will hold tightly, and may be pushed up and down when the reading is made. The refraction of the solution in the burette causes a distinct pointer at the bottom of the meniscus, making the reading very easy.



NEW JERSEY ZINC CO.'S ANNOUNCEMENT.

The New Jersey Zinc Co., New York City, announces the following prices on Florence brand, French process, oxide of zinc, for shipment on contract, during the second three months of 1916:

	Carloads.	Less Carloads.
White Seal	25 cents	25 1/2 cents
Green Seal	24 1/2 cents	24 3/4 cents
Red Seal	24 cents	24 1/2 cents

The above prices are based upon shipments in barrels f. o. b. shipping point, with freight allowance as heretofore on carload lots only. The above prices effective from March 2, and subject to change without notice.

Contractors are requested to advise promptly the quantity desired to be covered by contract.

Processes of Rubber Footwear Manufacture.

THE INDIA RUBBER WORLD for December, 1915, contained an article on "Modern Industrial Methods in the Rubber Industry," which attracted the attention of a well-known rubber superintendent, who at once wrote the Editor of THE INDIA RUBBER WORLD, commending the article, at the same time suggesting that the beginning of efficiency was in the arrangement of the factory. He submits the general plan or layout, shown in the adjoining column, outlining the general flow of materials. In this instance it applies to the manufacture of rubber footwear which affords a typical opportunity for co-ordinated systems of cost accounting and efficient operation. Certain of the departments named would require sub-division in actual operation to take care of special features of stock preparation and other work preliminary to actual shoe making. The plan is actually a basic one and with modifications could be utilized for a variety of lines of rubber manufacture.

MANUFACTURING PROCESSES.

The general process of rubber footwear manufacture are briefly described below in the order indicated in the departmental plan, omitting all details descriptive of machinery, tools or appliances necessary to the work:

WASHING.—Crude rubber is softened by soaking in warm water; cut and washed for removal of soluble and mechanical impurities. It is delivered in rough sheet form to the drying department.

DRYING.—Washed rubber is prepared for further treatment by air or vacuum drying.

MILLING.—The dry rubber is masticated on warm mills to average its quality.

WEIGHING.—Rubber, reclaimed rubber and mineral ingredients are weighed for mixing in standard lots or batches.

MIXING.—Standard batches are mixed, and refined as rubber stocks.

FABRICS.—Fabrics are machine dried and rolled on shells preliminary to calender coating.

WARMING.—The refined mixed rubber stocks are softened on warming mills preparatory to calendering.

CALENDERING.—Rubber stocks are sheeted for uppers, soles and heels.

Fabrics are coated with rubber to prepare them for use as linings, stay pieces or outside finish for shoes.

CUTTING.—Calendered materials are cut by hand or machine to specified patterns.

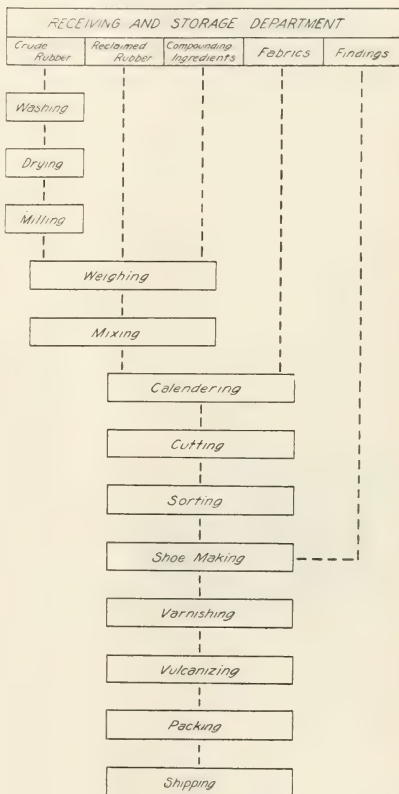
SORTING.—The various shoe parts of rubber and rubberized fabrics are counted and grouped in parcels by shoe makers' numbers, in accordance with printed tickets of instruction, proceeding from the order department.

CONSTRUCTION.—The rubber and rubberized parts are built in proper sequence on wooden or metal lasts, into boots and shoes.

VARNISHING.—The unvulcanized goods are varnished either by hand or by dipping machine. Dull surfaced goods proceed direct from making to vulcanizing department.

VULCANIZING.—Goods, racked in cars, are vulcanized in chambers heated by dry steam heat or by various pressure cure systems.

PACKING.—Goods are removed from the lasts, paired, marked, inspected and boxed. The lasts are returned to the making department if needed immediately; otherwise they are stored until required.



MANUFACTURING PLAN FOR RUBBER FOOTWEAR, SHOWING STORAGE AND FLOW OF MATERIALS.

Auxiliary to this plan there are required the following departments:

1. Power, light and heating.
2. Designing department for goods, patterns and lasts.
3. Press department for molding boot heels.
4. Cement making department.
5. Varnish making department.
6. Dye house for coloring linings.
7. Printing office for tickets, labels and factory forms.
8. Repair department, including machine, roll engraving, carpenter, pipe-fitting, blacksmithing and electrical shops.
9. Last making department.
10. Box making department for wood and paper boxes.
11. Rubber reclaiming department for waste.

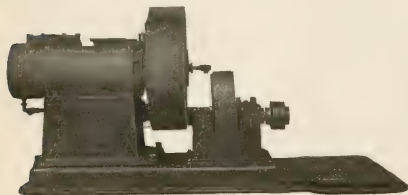
New Machines and Appliances.

ALLEN 10-INCH TUBING MACHINE.

THE steady growth and expansion of the rubber industry is reflected in the insistent demand for larger capacity machines in the making of rubber goods. That the tire business is no exception to this rule is shown in the illustration of a large and powerful tubing machine, designed for making solid truck tires.

The machine is of extra heavy design. The feed box measures 9 by 10 inches, and is capable of handling large quantities of stock without forcing the feed. The length of the cylinder has been increased to allow greater bearing surface for the worm, thereby increasing the compression and giving greater density to the stock. The stock worm is made from a solid forging, bored for water circulation, the delivery end being counter-bored, thereby reducing the metal at this point so the circulating water will more readily cool the worm.

The stock worm spur gear has a 12-inch face and a bronze bushed hub bearing directly on the thrust block. This is 22 inches in diameter at this point, resulting in a large and rigid bearing that greatly relieves the worm from the usual side thrust strain. The reduction gears are double helical cut, with semi-steel gear and forged steel pinion. The outboard bearing pedestal is en bloc, the three bearings being cast in one piece with large oil reservoirs and self-oiling devices. All gears are entirely protected by heavy steel guards. The bed plate is



continuous and provides space for the motor, which is supplied by the purchaser. A 60 h.p. variable speed D. C. motor is considered good practice. [Allen Machine Co., Erie, Pennsylvania.]

A MACHINE FOR TRADE-MARKING FABRICS AND PROOFED RUBBER GOODS.

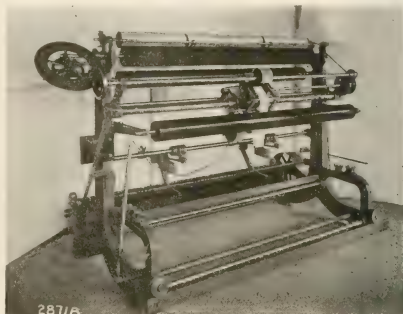
The manufacturers of tire fabrics, proofed fabrics and carriage cloth will be interested in the following illustrated description of a machine that has recently been adapted to the rubber industry.

The Kaumagraph machine takes the cloth from the roll or loose fold, trade-marks it, measures it and delivers the goods in the roll. Moreover, the fabric can be inspected at the same time.

The trade-marking attachment is mounted above at the right hand end of the machine and stamps on the upper surface of the cloth, so that the impressions may be inspected immediately after being struck and without stopping the cloth.

The machine is fitted with a hand wheel and screw to adjust the attachment for different widths of goods. The cloth will, therefore, always run in the center of the machine. The adjustment is so quick that various widths of pieces may follow each other without inconvenience. The trade-marks may be spaced at any distance apart and convenient means are provided to place a trade-mark close up to the ends of each piece.

The double drum rolling mechanism at the back of the machine has guide stands with quick adjustments to take any gudgeoned roller within the machine's capacity. The cloth may be threaded direct from the stamping table to the roll, or may first



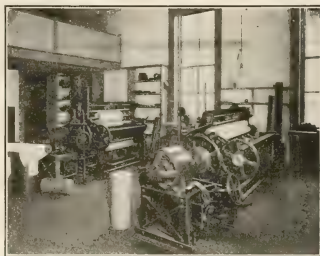
pass under both drums, around and outside of the outer drum to the roller. The latter threading gives the stronger drive and a harder roll. Those who market their fabrics wound in the open width on any kind of a roll or tube, can adapt lifts as a final packaging machine.

The following are the specifications: Widest cloth capacity, 66½ inches; driving pulley diameter, 10 inches; revolutions per minute, 60; belt width, two inches; length over all (right and left), 98 inches; depth (front and back), 50 inches; height, 68 inches; shipping weight, 1,500 pounds. [Parks & Woolson Machine Co., Springfield, Vermont.]

MACHINE FOR SLITTING AND REWINDING RUBBER.

Cameron's slitting and rewinding machine can be used on all sorts of rubber goods such as sheet rubber, coated fabric, canvas belting, insulation, etc.

The slitting wheel, which presses rather than cuts through the material, is a disk having a V-shaped edge, blunt and mounted



on a ball-bearing center, pressed against a highly polished steel cylinder. Very little attention is required to keep it in good working order. The fabric passes between the cutter roll and

the slitter wheels, and is severed into strips of the desired widths, which go forward side by side to the rewinding mandrel. The cutter gives a clean, smooth slit, does not stretch the edge of the fabric, and can quickly be set for spacing. Strips of any width or any combination of widths may be cut at the same time. The apparatus for rewinding the goods following the slitting is of the drum type, and is so arranged that the resulting rolls are very firm and compact. Provision is also made for removing a wrapper or separate cloth from the material previous to slitting, and for reinserting a wrapper in the rewound coils as they are rolled up after the slitting process. A variation is the making of slitting wheels with zigzag edge, by which strips can be cut which will not fray at the edges, and are especially suitable for surgeon's bandages, with the result that at one process, goods can be converted from piece form into finished bandages. [Cameron Machine Co., Brooklyn, New York.]

HAND OPERATED CLOTH OR RUBBER TESTER.

This is an inexpensive fabric tester that is now being used to advantage in the rubber trade, particularly in the manufacture of footwear. The resulting tests obtained by this very simple machine are extremely accurate.

As illustrated, it is 5 feet long, and is mounted on a strong oak back-board, fitted with three malleable brackets for



fastening to the wall. Built on the dead weight or swinging pendulum principle, it has no springs to affect the test and therefore remains accurate, but can be easily calibrated without the use of special apparatus. The clamps are designed to make various styles of tests and the open space back of the flat gripping surfaces allows any number of tests to be made on large samples without cutting or stripping. Special clamps can be applied for making rubber tests which would make this machine very useful in checking results.

The test is made by turning the large hand wheel which moves the stretching screw through powerful, machine-cut, spiral gears. The pendulum or weight lever is suspended from two finely-made, self-aligning, hardened steel ball-bearings which insure against friction and unnatural resistance. The dial registers in pounds and the test is shown by the pointer which remains at the position of the break until rest by the handle suspended from the curved quadrants.

Very little effort is required to make tests and experience has shown this to be a very quick machine for practical work. All parts of this machine are built to United States standards and are interchangeable. [Henry L. Scott & Co., Providence, Rhode Island.]

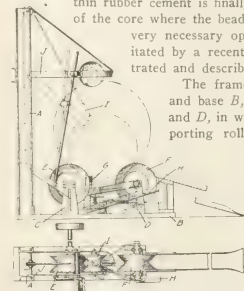
APRON FEED FOR MIXING MILLS. This latest invention of Welton's automatically holds both edges of the apron sufficiently tight to effect positive forward movement when lumpy or sticky compounds are mixed. [P. E. Welton, Cuyahoga Falls, Ohio. United States patent No. 1,173,625.]

Two patents granted to the same inventor, for similar devices, were described in THE INDIA RUBBER WORLD, June 1, 1915.

MACHINERY PATENTS.

GAMMETER'S PNEUMATIC TIRE CORE REVOLVING MACHINE.

THE heavy cast-iron cores used in making tire casings require scraping and brushing after each molding operation to remove accumulations of adhering rubber. Moreover, a coating of thin rubber cement is finally applied to the side faces of the core where the heads are to be placed. These very necessary operations are greatly facilitated by a recent invention, herewith illustrated and described.

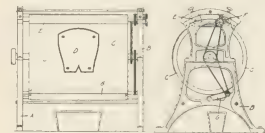


The frame comprises an upright *A* and base *B*, provided with bearings *C* and *D*, in which revolve two core-supporting rollers *E* and *F* having V-shaped peripheries—the former being belt driven, and the latter an idler. Between these rollers is mounted a Y-shaped core rest *G*, that is raised and lowered by the treadle *H*. The upper guide roller *I*, with a V-shaped periphery supports the core in an upright position, and is journaled on the swinging arm *J*, which can be raised and lowered to accommodate cores of various diameters.

The machine is operated by first raising the core rest, which is done by the foot on the treadle; then the core is rolled up the incline by the operator and placed on the idler roller and core rest. The latter is then lowered until the core rests on the driving roller, when the upper guide roller is lowered into operative position to maintain the core upright. The operator then starts the machine and performs the various cleaning operations with the use of scraping and brushing tools, while the core is being rapidly revolved. A coating of thin rubber cement is finally applied to the side faces of the core, which completes the operation. [John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co. of New York, New York City. United States patent No. 1,172,883.]

BOOT TOP LAYING AND CUTTING MACHINE.

Cutting and laying boot top linings, and in fact all other similar operations in footwear manufacture, are invariably performed by hand. This hand labor is laborious, tedious and costly, and besides, the product is often defective, due to the well-known fallibility of the human factor in manual operations.



The machine shown in the accompanying illustration has been recently invented to do the work of applying the fabric lining, used to reinforce footwear parts, to the sheeted rubber stock.

Side frames *A* and *B* support the revolving drum *C*, on which are removably fastened forms or dies similar to the one shown at *D*.

A sheet of stock is fed between the drum and the pressure roller *E*, one of the fabric linings being previously placed in the form *D*. The drum is then revolved and passes under the roller *E*, which firmly presses together the lining and superimposed rubber sheet, passing under heated roller *F*. As the drum continues to revolve, the boot top with attached lining is cut out

of the rubber sheet by heat and pressure of the roller against the edges of the form. After the form has passed beyond the roller *F* the reinforced boot top is removed by the operator. The scrap pieces are stripped from the drum by the action of belt *G*, which delivers them to the hopper under the machine. [E. B. Herman, East Watertown, Massachusetts, United States patent No. 1,173,426.]

SOLID TIRE DRILLING MACHINE. Solid and cushion tires may be drilled on this machine, to accommodate cross wires that engage the side wires holding the tire to the rim. [William C. Stevens, assignor to Firestone Tire & Rubber Co.—both of Akron, Ohio. United States patent No. 1,171,552.]

TIRE BEAD CENTERING DEVICE. This consists of a ring provided with an annular recess conforming to the contour of the finished bead. The ring is centered by three shouldered brackets or arms which slide within the inner circumference of the core. When the ring is revolved the bead is laid on the casing and accurately centered with relation to the tire. The other bead is applied in the same way. [John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City, United States patent No. 1,164,804.]

METHOD OF MAKING A CORD CARCASS FOR PNEUMATIC TIRES. Two layers of rubberized cord are laid spirally on the core, at a reverse angle, forming the carcass. This is slit around the inner circumference and the bead cores interposed between the open plies. The core is then removed from the winding machine and a section ring attached to the inner periphery of the core, supporting the beads. The casing and tread are then built up, the two side rings for molding the beads applied and the whole wrapped and vulcanized by the open cure process. [Walter R. Denman, assignor to Miller Rubber Co.—both of Akron, Ohio. United States patent No. 1,172,115.]

MANDREL FOR MAKING INNER TUBES. This invention comprises a mandrel provided with a depression for receiving materials for the valve patch which is made homogeneous with the tube. [Charles E. Foutts, East Liverpool, Ohio, United States patent No. 1,173,944.]

FOOTWEAR REPAIRING OUTFIT.—A new arrangement for repairing rubber footwear consists of a portable vise upon the anvil of which the shoe is placed, with the portion to be repaired uppermost. If the sole is to be renewed, a piece of rubber is placed over the old sole, and upon this is clamped a sheet of lead with any desired surface configuration, and having a projecting flange. This is hammered down against the edges of the sole or heel piece, thus giving a rolled edge similar to that of a new shoe. Then the shoe is removed from the vise, and after the parts are clamped in any suitable holder it is vulcanized. The result is a finished sole or heel substantially equal to that of a new shoe in neatness and finish. [James W. Arthur, Warren, Ohio. United States Patent No. 1,174,799.]

HYDRAULIC TIRE VULCANIZING MOLD AND PRESS.—The object of this apparatus is to partially vulcanize the tire cover before the curing operation which gives the tire its final shape. This relates more particularly to those having beaded edges, which are not rigid in the uncured condition. [Colin Macbeth of Birmingham, England, assignor to The Dunlop Rubber Co., Limited, Westminster, England. United States patent No. 1,174,885.]

A complete description of this machine was given in *THE INDIA RUBBER WORLD*, December 1, 1915, page 122, British patent No. 11,732 (1914).

OTHER MACHINERY PATENTS.

THE UNITED STATES.

ISSUED FEBRUARY 29, 1916.

- 1,173,444. Rubber working machine. E. B. Herman, East Watertown, Mass.
1,173,449. Mold for making inner-soles. C. B. Mansbach, assignor of one-half to F. L. Price—both of Brockton, Mass.

- 1,173,626. Feed mechanism for mixing mills. P. F. Welton, assignor to K. B. Welton—both of Cuyahoga Falls, Ohio.

ISSUED MARCH 7, 1916.

- 1,174,095. Machine for compacting parts of reinforced inner-soles. E. S. Simpson, North Scituate, and P. M. Vayette, Quincy, assignors to Clifton Manufacturing Co., Jamaica Plain—all in Massachusetts.
1,174,738. Splitter and rewinder. S. M. Langston, assignor to Samuel M. Langston Co.—both of Camden, N. J.

THE DOMINION OF CANADA.

ISSUED DECEMBER 31, 1915.

- 166,409. Tire mold core. The Gutta Percha & Rubber Limited, assignee of J. H. Coffey and J. H. Coffey, Jr.—all of Toronto, Ontario, Canada.

THE UNITED KINGDOM.

ISSUED FEBRUARY 16, 1916.

- 21,478 (1914). Machine for cutting jar rings and washers. Bertrams, Limited, St. Katherine's Works, Sciennes, and R. F. Gillespie, 58 Arden street—both in Edinburgh.
A similar machine was illustrated and described in *THE INDIA RUBBER WORLD*, May, 1915. British patent No. 1,916. Jar ring lathe. Bertrams, Limited, and R. F. Gillespie.

ISSUED MARCH 1, 1916.

- 22,105 (1914). Cooling roll for mixers. J. H. Nuttall and D. Bridge & Co.—both of Castleton, Lancashire.

ISSUED MARCH 8, 1916.

- 22,489 (1914). Machine for coagulating latex. S. C. Davidson, Sirocco Engineering Works, Belfast.

THE GERMAN EMPIRE.

PATENTS ISSUED (With Dates of Validity).

- 290,322 (March 5, 1915). Strip cutting machine for rubber sheets and similar materials. Dr. Karl Lehmann, Karlstrasse 4, Berlin-Lichterfeld.
290,295 (October 21, 1913). Kneading installation for working plastic masses. Albert Sigwart, Karlstrasse 7, Ludwigshafen-on-the-Rhine.
290,856 (December 28, 1915). Apparatus for coagulating crude rubber. Th. L. Adolf Runge, 61, Podbielskistrasse, Hanover.

NEW MANUFACTURING PROCESSES.

THE UNITED STATES.

MANUFACTURE OF HEELS. Scrapped solid tires are cut transversely and made into heel blanks which are built up and formed into finished heels provided with washers and nail holes by heat and pressure. [U. S. Patent No. 1,172,919. Henry C. Weber, Port Jefferson, New York.]

MOLDING AND VULCANIZING TIRES. Pneumatic tires are molded on a core in a sectional mold. The tread portion is removed radially, while the sides and edges of the tire are stretched in a direction away from the tread. The tire is subsequently removed from the mold and vulcanized in any suitable manner. [United States patent No. 1,166,326. J. H. Coffey and J. H. Coffey, Jr., Ontario, Canada, assignors of one-half to Gutta Percha Rubber, Limited, Toronto, Canada.]

UNITING HARD RUBBER AND METAL. Hard rubber and a threaded metal member are united by heating the former and screwing the latter into an opening in the heated hard rubber, which is then allowed to cool. [United States patent No. 1,165,680. George C. Knauff, Chicago, Illinois.]

UTILIZING WASTE RUBBER. Soles and heels of footwear are made by disintegrating unvulcanized scrap, and subjecting this material to pressure and vulcanization. [British patent No. 21,445. G. W. Beldam, Ealing, and A. U. B. Ryall, Brentford, both in Middlesex.]

OTHER MANUFACTURING PROCESS PATENTS.

THE UNITED KINGDOM.

ISSUED FEBRUARY 23, 1916.

- 21,768 (1914). Hot water bottle. T. Rowe, 52 Harold Road, Leytonstone, London.

THE GERMAN EMPIRE.

PATENT ISSUED (With Date of Application).

- 290,713 (April 11, 1913). Process for making hollow objects out of rubber. Dr. Carl Datschuer, 21 Gilbachstrasse, Cologne.

THE EDITOR'S BOOK TABLE.

HANDLEIDING VOOR DE BEREIDING VAN RUBBER. BY DR. P. A. J. VAN DER WERF. Published in the Dutch language as a communication of the Malang Test Station, Malang, Dutch East Indies. [8vo, 45 pages. Paper bound.]

As indicated by its title, "Manual for the Preparation of Rubber," this work is intended to serve as a handbook for the use of planters in preparing their rubber for market. It is especially intended for planters in the Dutch colonies but can be used to advantage by all rubber planters acquainted with the language of the Netherlands. A clear idea of its scope can be formed from the following titles of its several chapters:

Latex in the Gardens and in the Factory; Determination of the Rubber Content of Latex; Preparation of Rubber Sheet; Mistakes Made in Preparing Rubber Sheet; Preparation of Rubber Crêpe; Mistakes Made in Preparing Rubber Crêpe; Preparation of Inferior Sorts (of rubber); Mistakes Made in Preparing Inferior Sorts; The Sorting and Packing of Rubber; Prescriptions for Making Solutions Used in the Preparation of Rubber.

NEW TRADE PUBLICATIONS.

THE Miner Rubber Co., Limited, Granby, Quebec, Canada, has issued its catalog No. 7 for 1916-17. It is a handsomely illustrated 64-page book showing the many styles of rubber footwear made by this company. A decided innovation in printing pictures of rubber footwear is the showing of the rubber overshoe in full black, while the exposed portion of the shoe is printed in a soft gray half-tone effect, making a striking illustration. Beside the regular line of rubber boots and shoes several specialties are shown, one being a rubber boot of heavy gum with leather sole quilted with hob-nails. There are also boots with red soles and boots entirely of red gum. A list of the new pressure-cured goods in gray finish is illustrated, and also a large list of outing shoes in white, gray, tan and blue canvas with self-colored or contrasting rubber soles. The book contains other information of interest to dealers in this brand of rubber footwear.

Link-belt machinery is fully described and pictured in a finely printed book published by the Link-Belt Co., Chicago, Illinois, in which are shown many fine half-tones of the lines of conveyors and elevators made by this company. Of special interest to the trade are the conveyor belts offered by this concern, which are rubber belts from three to ten ply, with an extra rubber cushion on the carrying side 1/16th to 1/8 of an inch in thickness. This cover or cushion is turned around the edges and vulcanized on the under side, and thus is less liable to crack or peel off than might be the case with belts where the rubber edges are molded on separately. There is much information of a general character for concerns handling coal, stone, gravel, sand or similar products.

W. G. Brown & Co., Cincinnati, Ohio, dealers in crude rubber, distribute monthly a picturesque little calendar, the one for March bearing a striking lithograph of two midnight visitors with burglarious intent arousing a sleeping couple. While, perhaps, the picture is not particularly appropriate to the business of the firm, the calendar is an attractive and convenient desk ornament.

Decreasing truck vibration is treated in a booklet issued by The B. F. Goodrich Co., Akron, Ohio, explaining the "De Luxe" and regular solid truck tires made by that company. Illustrations and diagrams, together with suitable

text, are intended to prove that these tires decrease truck vibration and tend to give more comfortable as well as much longer and more durable service than ordinary tires. The booklet, though a small one, is gotten out in very attractive form and reflects great credit on the advertising department of the Goodrich company.

The Kokomo Rubber Co., Kokomo, Indiana, is sending out to the trade a rather striking folder which shows a half-tone reproduction of the first automobile built in America and which was equipped with the first automobile tires made in America or in any other country. The folder is devoted to advertising the Kokomo Gridiron Non-Skid and the Kokomo Smooth Tread tires, both of which are pictured and explained. In a corner of the folder is a form which can be detached, then becoming a post-card directed to the company, which needs only the signature and address of the sender to receive further information regarding these tires.

A very attractive piece of advertising comes from the Canadian Consolidated Rubber Co., Limited, Montreal, Canada, it being a folder bearing the question: "Who Wears Rubber Footwear?" and answering that question by showing about 30 pictures of people in various walks and rides of life wearing rubbers. The vacuum process of vulcanizing is explained with a cut showing a hand holding a piece of the pressure cure soling and another piece vulcanized by the old method, thus contrasting strongly the difference between the two. The folder is as attractive in its text as it is in its illustrations, and is one which will be given more attention than the average piece of circular mail matter.

Another folder gotten out by this company that is worthy of special mention is one showing a rolled edge lumberman's over, and one with a plain edge sole, but of red rubber. A fine looking young man is represented as showing the differences between these two, being photographed in various positions, the accompanying argument being that as each has the same amount of rubber in the sole, the plain edge sole necessarily has more wear where the wear comes than if a portion of the material was surrounding the upper. Some argument regarding the vacuum vulcanization is also given. The circular is attractively displayed in three colors of ink, and is a worthy companion of the previously mentioned one.

The Raw Products Co., New York City, is sending out to its customers a very comprehensive sheet giving the india rubber statistics for the year ending December 31, 1915, which shows the United States imports and stocks on hand of the various kinds each month in the year, the same facts regarding England, and the monthly quotations, the arrivals at Para, stocks at Para and Manaos and the plantation production. There is also a diagram showing the fluctuations of fine and coarse Para and of First latex crêpe for 1913, 1914 and 1915. It will make a very convenient and comprehensive document for ready reference.

Owing to the seizure by the British Government of many of the motor vehicles for war purposes, there has been a remarkable increase in the importation of American trucks and other commercial vehicles. As the tires for these are measured in inches, while tires made upon the continent or in Great Britain are almost invariably given in metrical measurements, The B. F. Goodrich Co., Limited, London, England, has issued a booklet entitled "Goodrich Solid Rubber Band Tyres. Inch Sizes for American Vehicles." Besides a general description, with half-tone illustrations and diagrams, it gives in tabulated form the size in inches, the diameter over permanent steel land, maximum load for tire, price, and code word for facili-

tating ordering. There is also included considerable information regarding the care and abuse of solid tires and some hints regarding alignment, with simple means for testing, this being illustrated by diagrams. The book also contains the guarantee which the company furnishes with each sale of its solid tires.

"Rubber Facts and Figures" is the title of a compact little book of about 140 pages published at somewhat irregular intervals by Frederic C. Mathieson & Sons, London, England. Number 13, bearing date of February, 1916, is at hand. While small enough to go in the pocket, a vast amount of information has been crowded into it regarding rubber planting corporations in the Far East, telling the authorized capital, highest and lowest prices and number of shares, number of acres planted in rubber, dividends paid, etc. The increases in the outputs month by month during the past two years are given in tabulated form. The number of forward sales announced for 1915 and 1916 is also given. In fact, the book is one which will be found of use as a ready reference by all interested in plantation rubber, either as consumers or investors.

DETERMINATION OF BARIUM SALTS IN VULCANIZED RUBBER GOODS.

SPECIFICATIONS for purchasing rubber goods frequently permit the use of barytes (barium sulphate) as a mineral filler without having the sulphur which it contains count as part of the specified total sulphur. In such cases, in order to properly correct the total sulphur, the barium sulphate must be determined. The Bureau of Standards, of the Department of Commerce, has recently completed a careful study of the question and has just published the results in "Technologic Paper No. 64."

When barium sulphate only is used, the amount present is readily ascertained by determining the total amount of barium present. If barium carbonate is used, it is necessary to separate the two salts. By means of tests made on compounds of known composition prepared at the Bureau of Standards, a method has been devised which permits the quantitative determination of barium carbonate in the presence of either lead sulphate or barium sulphate, the two sulphates most commonly used in rubber goods. The accuracy of the determination is satisfactory for all practical purposes. This method of analysis for barium carbonate, which is the work of John B. Tuttle, is as follows:

One gram of the rubber is ignited in a porcelain boat in carbon dioxide, the residue finely ground in an agate mortar, transferred to a 250 cc. beaker, and treated with 5 to 10 grams ammonium carbonate, 15 to 20 cc. of strong ammonia water, and about 50 cc. of distilled water. The mixture is boiled for 15 to 30 minutes, filtered and the precipitate thoroughly washed to remove all soluble sulphates. The residue on the filter paper is washed back into the original beaker with distilled water. About 10 cc. of glacial acetic acid and sufficient water is added to make the total volume of the solution about 100 cc. By this procedure lead, barium, calcium and zinc carbonates pass into solution, while barium sulphate and lead sulphide are not attacked.

Hydrogen sulphide is passed into the filtrate, the lead sulphide filtered off, the filtrate heated on the steam bath, and 10 cc. of 10 per cent sulphuric acid added. The following day the precipitate is filtered, ignited, cooled and weighed.

The final step is to determine the total barium in the rubber compound, as barium sulphate, by the method for determination of barytes used at the Bureau of Standards [THE INDIA RUBBER WORLD, December, 1914, page 128.] Barium carbonate is determined in a separate sample by Mr. Tuttle's method, just described, and an equivalent amount of barium sulphate is deducted from the total barium sulphate. The sulphur in the remaining portion of barium sulphate is calculated, and the total sulphur determination corrected by this amount.

RUBBER TRADE INQUIRIES.

[155.] A correspondent seeks an American manufacturer who can furnish 5,000 valves for bicycle inner tubes, to be shipped from America to Singapore.

[156.] An inquirer desires to be placed in touch with a manufacturer of waxed paper, such as is used in wrapping inner tubes.

[157.] We are in receipt of an inquiry for Pontianak refining concerns.

[158.] An inquiry has been received for the name of a manufacturer of flexible rubber curry combs.

[159.] A correspondent wishes to be placed in touch with American firms who can supply crude rubber stock (washed, compounded and rolled into sheets but not cured) for use in the manufacture of about 15,000 inner tubes for automobiles.

[160.] The name of a company making and selling the hard rubber clincher bead which is the center of the bead used in making tires is desired.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Representation for American manufacturers of rubber goods is desired by a man in Argentina. Report No. 20,291.

A Portuguese firm, which exports rubber, desires to secure an import agent in New York City. This firm also wishes to represent American exporters of goods for Portuguese African colonies. Report No. 20,295.

Quotations from American manufacturers of jinrikisha tires are solicited by a firm in China using about 6,000 tires annually. Report No. 20,329.

A Norwegian firm would like samples and quotations f. o. b. New York on rubbers and arctics. Report No. 20,352.

A man in Italy wishes to purchase American jam jars and bottles for preserves or fruits, with tin lids and rubber rings. Report No. 20,369.

A Canadian firm would like to be placed in touch with American manufacturers and exporters of rubber window cleaners. Report No. 20,412.

Vulcanized fiber and other insulating materials are desired by a firm in England. Report No. 20,435.

A traveling agent in Norway desires to receive samples, catalogs, quotations, etc., from American manufacturers of raincoats for both men and women. Report No. 20,448.

DRAWBACK FOR RUBBERIZED AUTO-TOP CLOTH.

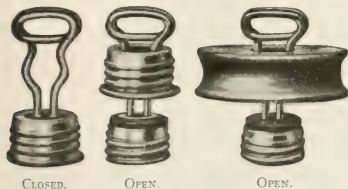
The exportation of auto-top cloth has reached such proportions, due to war requirements, that the Treasury Department has prepared drawback regulations to meet the situation. As in the case of other classes of drawbacks, manufacturers are required to keep a detailed record of all data necessary for government agents to base a decision as to whether a drawback accrues or not. It is specified that the allowance shall not exceed the quantity of imported cloth used in the manufacture of the exported auto-top cloth, as shown by the abstract from the manufacturing record, the allowance to be reduced according to the quantity of imported cloth which the value of the waste, if any, will replace. The American Rubber Co. and the Stoughton Rubber Co. have been authorized to receive drawback under these regulations.

New Goods and Specialties.

THE DEAN NON-LOSABLE STOPPER.

THE stopper of a hot water bottle is always getting lost or misplaced just when the family comforter is most needed.

A stopper that is always on the job; that cannot be lost; that does not depend on a chain or exterior attachment, would be a boon indeed, and such apparently is the device described and illustrated as follows:



CLOSED.

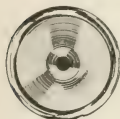
OPEN.

OPEN.

The inventor has reversed the principle of the old arrangement by placing the stopper inside the bottle instead of outside. A wire handle serves to operate the stopper. To open the bottle simply unscrew and push the stopper down far enough to allow free passage of the water either in filling or emptying. To close the bottle, just pull up on the handle and screw the stopper in place, the rubber washer making a water-tight joint when forced against the upper part of the outer metal socket. This device can be attached to a hand-made bottle as well as a molded bottle with a wide neck. [H. D. Dean, Boston, Massachusetts.]

SOFT-LITE HEADLIGHT DIMMER

The laws of many states compel the use of automobile headlight dimmers to reduce the glare that is confusing and dangerous. The device we are now describing is made of a single disk of frosted pyralin that diffuses and effectively eliminates the glare of the headlight, yet illuminates the roadway fully 100 feet in advance of the car.

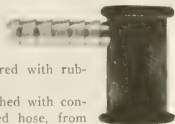


The quick, easy and secure method of attaching this dimmer is a feature that will be appreciated by the motorist. It is held securely in place on the inside of the headlight glass by a single vacuum cup of soft rubber. [The Harry H. Reynolds Co., 1326 Michigan avenue, Chicago, Illinois.]

RUBBER COVERED TIRE INFLATOR VALVE.

Garage men who have been annoyed by the carelessness of patrons, who, after inflating tires at their free air station, have neglected to shut off the flow of air, will welcome the new Schrader automatic inflating valve, which has just been put on the market, and which prevents any waste, either before, during or after inflation. The valve is covered with rubber for protection.

This device, which can be furnished with connections suitable for different sized hose, from $\frac{1}{4}$ to $\frac{5}{8}$ -inch diameter, fits into the tubing of the garage air line, and permits the egress of air only when it is applied to the valve of the tire to be inflated. All that is necessary is to hold the inflating valve's nozzle against the tire valve. This opens the valve check in the angle valve, and allows the air



to come from the rubber tubing into the tire. Immediately the pressure on the tire valve is removed, the valve in the hose automatically closes, and the air pressure remains in the tank. [A. Schrader's Son, Inc., New York City.]

LIGHT SPORTING BOOTS.

Many sportsmen would wear rubber wading boots were it not that they are so heavy and clumsy as to be uncomfortable when not actually required for going through the water. An improved, light-weight, storm king style sporting boot named "The Angler" is now manufactured, which can be worn over the leather shoe, and which, when not in use, is so light and flexible that it can be rolled up into a small enough package to be carried in the coat pocket. The advantage of such a boot is obvious without further comment. This particular boot is made of pure gum, is fusion lined and has an elastic top, thus fitting tightly around the leg. [Canadian Consolidated Rubber Co., Limited, Montreal, Canada.]



A HANDY RUBBER STAMP.

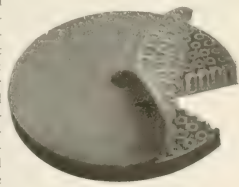
The pencil cap here reproduced, actual size, is designed for use as a convenient rubber stamp for marking initials on cloth, paper, or articles of any kind. The desired initials are cemented on the plain, broadened base of the rubber cap, which fits easily and securely over the end of the pencil. In clerical work the advantage in the lessening of time and energy consuming motions can readily be seen, as the user does not have to put down his pencil to pick up a rubber stamp, but simply turns the pencil about and applies the stamping end. [The William Stern Manufacturing Co., Chicago, Illinois.]



Actual Size

PNEUMATIC REVERSIBLE LANDING MAT.

When a fire call is received at an engine house, stairs are too slow a method for the firemen in the upper story to gain the main floor. The vertical sliding pole gives the desired speed. The necessity of a landing mat that will minimize the shock of contact with the floor can readily be seen, and rubber mats are invariably used for this purpose. But in order to afford the proper yield and recovery the mat here shown has been specially constructed. It is claimed that a perfect pneumatic mat is thus secured, offering a soft, safe and durable landing at the base of the sliding pole. Each of the tubes supporting the wearing surface of the mat has a vent into the main air chamber, which is also provided with one or more vents



in the side wall. This permits a uniform escape of air which gives an even yield and recovery. Both sides of this mat are alike, so that it may be reversed and thus give double service. [Bowers Rubber Works, San Francisco, California.]

STAIR TREAD WITH RUBBER STUDS.

In the stair tread here illustrated, interchangeable studs, molded of tough, dark grey rubber, in a new design, fit into the grey-white, non-corrosive, cast metal plate which forms the body of the tread. The studs are easily fitted by simply screwing down and are arranged in lateral rows, facilitating the operation of cleaning or sweeping. When the center studs are worn down, and this it is claimed does not occur until after considerable usage, it is a simple matter to rearrange them by the use of a screw-driver. When the treads are fastened on the stair an empty space is left behind the rear edge which may be filled with rubber matting, if desired. [The Reliance Rubber & Harwood Co., London, England.]

THE "TESTOID" RADIATOR HOSE.

In the radiator hose here illustrated the manufacturer claims to have secured a motor hose that will not harden, soften, crack or collapse, or be in any way affected by the heat generated from the motor. It is also guaranteed to withstand the action of oil, hot or cold water, and anti-freezing solutions. The cover is black, and the tube, cover and friction are all thoroughly tested compounds. The hose is furnished in either two-ply or three-ply duck, with plain or capped ends, or capped ends beveled; also with enlarged or tapered end, if desired. A similar variety of hose, called the "Thermoid," has a white cover.

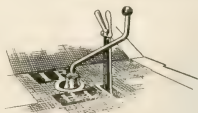
The hose is packed according to a new system which is said to find favor with dealers. Six pieces, three feet long, each piece of a different diameter, or all of the same diameter, are packed in a box. The six largest selling sizes of hose are 1¼, 1½, 1¾, 2 and 2½ inches, respectively, these sizes making a convenient assortment for a box. [Thermoid Rubber Co., Trenton, New Jersey.]

THE "ROYAL" SPARK-PLUG TESTER.

The "Royal" tester for spark plugs on automobiles, motorboats, motorcycles, etc., consists of a crotch containing the spark gap and two legs containing the terminals. One leg is three inches longer than the other, facilitating contact. The tester will show the regular spark when the plug is good, and if it is short-circuited there will be no spark. An irregular spark will indicate defective porcelain; a clear spark, lack of power in the motor. This convenient accessory is covered with hard rubber. [Pittsburgh Electric Specialties Co., Pittsburgh, Pennsylvania.]

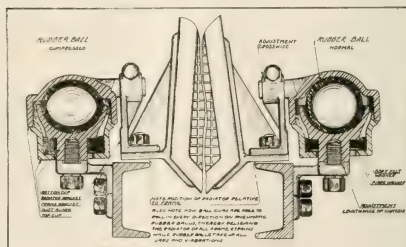
GEAR GUIDE-MAT.

Owing to the number of different gear positions on different cars, the unaccustomed driver frequently has difficulty in finding the right gear. In a 1916 model car all doubt and hesitancy is eliminated by the simple expedient of marking the gear positions in large, clear letters on the rubber mat in the driver's compartment, as shown in the accompanying illustration. [Grant Motor Co., Findlay, Ohio.]



A FLEXIBLE RADIATOR SUPPORT.

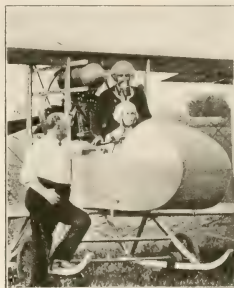
A novel feature of the Menominee truck is the radiator support, which forms a flexible joint between the chassis and radiator. A hollow rubber ball encased in each connection,



guards the radiator against road shocks, vibration and all warping stresses. The device is protected against dirt and grit, and the brackets carrying the head lamps are also supported on this pneumatic shock absorber. [D. F. Poynter Co., Menominee, Michigan.]

THE TURNER AVIAPHONE.

Noiseless flying machines have still to be invented. The propeller and motor of flying craft, in its present state, create so much noise that a pilot and passenger cannot hear each other speak. This difficulty has finally been overcome by the invention and perfection of an instrument called the "Turner Aviaphone." A rubber face mask with an aluminum mouthpiece, connecting with the breastplate transmitter by means of a hard rubber tube, is used only during conversation. There are two helmets, or caps, two specially wound receivers for each user, connecting cords, battery, plugs and jacks; the entire outfit weighing only 5 pounds 5 ounces. Caps, as shown in the illustration, are furnished but the receivers can be adjusted to any type or size of headgear. This instrument is of especial value to army and navy aviation corps, as it leaves the hands entirely free. [General Acoustic Co., New York City.]



BATHING COSTUME NOVELTIES.

RUBBER accessories for the bathing costume have grown more numerous every year, and also more attractive. The innovations of this season far surpass those of former years in utilization of this product for combined ornamental and practical purposes.

The first illustration shows a charming costume for the trip to and from hotel or bathing house, conforming to the regulations of some seaside resorts requiring that the bathing suit be covered. The smock worn over the bathing suit is made entirely of rubber, in a pleasing



shade of light blue with a white collar. The smocking on the front, back and sleeves is accomplished by clever cementation of the rubber instead of sewing.



With this highly becoming yet utilitarian garment is worn a "Chin-Chin" hat in black and white, the under part forming a skull cap, which affords adequate protection for the hair.

In the Spanish costume shown in the second sketch a novel style in bathing suits is inaugurated. It is intended to be worn over an Annette Kellerman suit, and comprises a one-piece rubber tunic in a clear, light red, with black



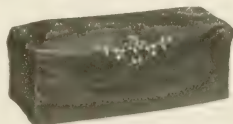
rubber fringe trimming. The coquettish swathed turban is also in red with black fringe.

The sash worn in the form of a knotted girdle with tasseled ends, and the Tam O' Shanter cap in the third illustration are made of black and white striped rubber and are striking adjuncts to the bathing costume. Within the Tam O' Shanter and cemented at the edges is a skull cap of gold-colored rubber, which fits snugly over the hair.

Still another novelty is a hat-brim of rubber, the inner edge encircled with rubber flowers, that can be placed over the skull cap as a protection from sunburn when not in the water. [L. C. Studios, New York City.]

BATHING SUIT CASE.

Department stores are showing this very presentable case for carrying a wet bathing suit. It is made of black sateen, fitted with a separate rubber lining. It has snap fastenings, and is tastefully decorated with an embroidered flower motif in varying shades of pink, with green stems.



S. S. WHITE BUFF RUBBER DAM.

The rich cream or buff color of this improved rubber dam for dental use helps to light the oral orifice. It is claimed that the texture is exceptionally elastic, strong and durable and that when placed around the tooth which is to be operated upon, it clings closely, excluding all moisture and keeping the cavity in the absolutely dry condition necessary for successful filling. The dam is highly useful in abdominal operations where the surgeon makes his incision through the rubber into the tissue. There is no risk of injurious contamination through direct contact of the dam with the body secretions. It is recommended for the following uses in surgery: As surgical sheeting, in oral dental surgery, in abdominal surgery, for abdominal dressings, for surgical bandages and pressure bandages, for moist dressings or Priestness dressings; or it may be cut in small strips and used for ligaturing, as it is strong enough to allow any pressure that may be desired. This dam is made in rolls of two widths, five and six inches, and two thicknesses—thin and medium. [The S. S. White Dental Manufacturing Co., Philadelphia, Pennsylvania.]

THE "KLEENWAY" AUTO BRUSH.

Washing an automobile with an ordinary sponge and water bucket is a tiresome and unpleasant operation. In the "Kleenway" auto brush, here illustrated, a convenient and also more efficient method is afforded. Attached to five feet of rubber hose, with coupling for attaching to house hose, is a specially constructed brush containing a soap chamber of nickelled brass tubing. A brass two-way valve in the handle is operated by thumb pressure, giving suds or clear water, as desired, and the flow of clean suds or water through the brush automatically frees the bristles of grit, grease, etc. The bristles are rubberset, and therefore cannot fall out, and being of



Tampico fiber, will not scratch. The handle is of white wood. Any good automobile soap can be used with this brush; it is easy to operate, and, it is claimed, cleans the car in half the usual time, with much less than the customary consumption of soap. [The S. & E. Co., New York City.]

The Obituary Record.

A PIONEER RUBBER MANUFACTURER.

THEODORE H. VIDETO, who for more than 30 years was connected with various New England rubber manufacturing enterprises, died at his home in South Framingham, Massachusetts, at the age of 82 years. He was born in Wilmot, New Brunswick, February 23, 1834. At the age of 17, so proficient was he in the higher mathematics, Latin, Greek and the modern languages, that he was

given a professorship in a New Brunswick seminary. After teaching there for 10 years he came to the United States for further study. In 1879, however, he forsook scholastic life, and began manufacturing light-weight solarized rubber clothing. His first position was with the Globe, later the Readville Rubber Co., "gossamer" rubber proofers. At this time all of these goods were plain black surfaced. Soon English rubber men began to send in beautiful silvered "electric" garments, the effects gained by surfacing with potato starch. In attempting to imitate this, an American company, the Solarized Rubber Co., brought out garments in checks and stripes, but lost money and gave up the business. Mr. Videto, however, after much experimenting, evolved a cheap and simple process for producing what was known as the "India stripe." In 1886 he secured the assistance of L. D. Apsley, who was then operating the Goodyear Gossamer Co. at Hudson, Massachusetts, and entered his employ. Later he went to South Framingham with the Gossamer Rubber Co., where his son was employed as superintendent. Upon the death of Ira M. Conant, the founder of the business, he left and took an advisory position with the Conant Rubber Co. The "gossamer" garments once sold by the million, were, however, being rapidly displaced by light-weight calendered, vulcanized goods, and in time the Conant Rubber Co. went out of business.

Mr. Videto did not seek another engagement, but devoted the remainder of his life to study and public work. For nine years he served as chairman of the Framingham school committee, and was chairman of the town's committee having charge of the construction of its new high school. He was a member of the board of trade, and of the town's committee on the separation of street and railroad crossings.

Mr. Videto was for many years a deacon of the First Baptist Church, Hyde Park, and was also deacon and clerk of the Park Street Baptist Church of Framingham. He was chaplain of Alpha Lodge of Masons, and belonged to Concord Royal Arch Chapter of Framingham. As a Knight Templar he was affiliated with the Natick Commandery. He was a charter member and past commander of Cyprus Commandery, Knights of Malta.

He married in 1857 Rebecca Homan Dodge, of Charleston, daughter of John and Sarah (Pedrick) Dodge. Four children survive, John F. Videto, Mount Vernon, New York; Nathaniel

E. Videto, Mrs. William Johnson, Framingham, Massachusetts, and Theodore E. Videto, Montreal, Canada.

MELVILLE HAZEN BARKER.

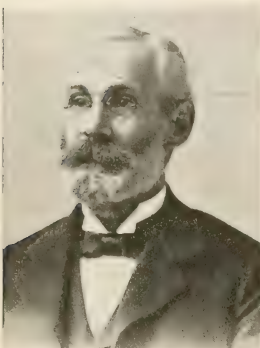
Melville Hazen Barker, general manager of the American Tool & Machine Co., Boston, Massachusetts, died on March 9 at his home in Dorchester, Massachusetts, after a short illness, of pneumonia. Mr. Barker was born in Bridgton, Maine, but when only three years old was taken West by his family, his early education being in the public schools of Chicago, after which he took an architectural course at the Wisconsin State University. Later he removed to Lawrence, Massachusetts, and became connected with the repair department of the Everett Mills, afterwards going into retail business. His store being burned out, he went to the repair department of the Atlantic Cotton Mills. In 1874 he became connected with the American Tool & Machine Co. and 20 years later became general manager, the position which he held at the time of his death. Mr. Barker was a charter member of the National Metal Trades Association and its president in 1907. He was a member of the Massachusetts Charitable Mechanics' Association, the City Club, Engineers' Club and Art Club, of Boston, and the Engineers' and Machinery Clubs of New York; also a Mason, an Odd Fellow and a Knight of Honor. He is survived by a wife and two children.

EDWIN R. HALL.

Edwin R. Hall, chief experimental engineer of the Goodyear Tire & Rubber Co., Akron, Ohio, died of pneumonia at Mt. Clemens, Michigan, March 17, where he had been taking treatments for rheumatism. Mr. Hall was born in Somerville, Massachusetts, in 1885, and educated in the grammar and

high schools of that city and at the Institute of Technology, from which institution he graduated as mechanical engineer in 1908, going directly to Akron to the Goodyear company in its experimental department, which he has seen develop from a one-man bureau to a department employing 125 men. He was very active in the Society of Automobile Engineers and the Clincher Automobile Tire Manufacturers' Association.

In the former organization he served on several committees and contributed a number of important papers, and at the time of his death was a member of the council of the Society and chairman of the Standards Committee. In the Clincher Automobile Tire Manufacturers' Association he was chairman of the Engineers Committee, and the present excellent condition of inspection, and satisfactory rims for



THEODORE H. VIDETO.



EDWIN R. HALL.

pneumatic tires in this country, is due largely to Mr. Hall's efforts. He was also a member of the University Club of Akron and of several Masonic bodies. Mr. Hall was acknowledged a man of keen perception in matters relating to mechanics and engineering practices, and his judgment along these lines was greatly respected. He is survived by a wife and two daughters.

JOHN HOPEWELL.

As we go to press word comes of the sudden death of John Hopewell in Washington, D. C., at the age of 71 years. Mr. Hopewell was one of the leaders in the industrial and financial circles of New England.



JOHN HOPEWELL.

He was born in Greenfield, Massachusetts, but spent his boyhood days at Shelburne Falls, removing to Springfield at the age of 21 and working on munitions at the armory there. A few years later he associated himself with the important firm of L. C. Chase & Co., Boston, Massachusetts, and five years later became a member of the firm, of which he was the senior member at the time of his death. He was formerly president of the Reading Rubber Manufacturing Co., Reading, Massachusetts, a director of the Sanford Mills, Sanford, Maine, a director of the First National Bank, Boston, and was connected with scores of other important corporations. He was a member of the Algonquin Club, the Boston Art Club, the Merchants' Club, the Boston Merchants' Association, the Boston Chamber of Commerce, the Boston Athletic Association, the Hunnewell, the Newton and the Brae-Burn Clubs. He also was a Mason. He was an active, public-spirited, shrewd man of affairs, and had a remarkably wide acquaintance with the leaders in American business. He leaves a widow, two daughters and three sons, one of whom, Frank B. Hopewell, is actively engaged in the L. C. Chase Co. and the Reading Manufacturing Co.

BENJAMIN L. ANDREWS.

Benjamin L. Andrews passed away Sunday, March 5, at his home in Beverly, Massachusetts, after an illness of several months' duration. Mr. Andrews was born at Essex, Massachusetts, on March 6, 1854. His first experience in rubber trade was with the Clifton Manufacturing Co., with which he worked for a short time as salesman for garments, but in 1894, desiring to enlarge his line, added some samples from the Globe Rubber Works of Boston, under a commission arrangement, and the next year he became the regular New England salesman for the Globe Rubber Works, which position he has held up to his death.

He was methodical in his habits, careful in his business dealings and anxious at all times to give service and satisfaction to his customers, all of whom he numbered among his personal friends. To many of them he was familiarly known as "Doctor." He was a member of Liberty lodge of

Masons, Amity chapter of Royal Arch Masons, St. George's commandery, Knights Templars; Aleppo temple, Mystic shrine; Bass River lodge of Odd Fellows and the Beverly Republican Club. He leaves a widow and one son.

ROBERT P. PARKER.

Robert P. Parker, who for several years was prominent in the bicycle business and for nine years in the employ of the Hartford Rubber Works Co. at Hartford, Connecticut, his home town, becoming sales manager and, later, New York branch manager for that company, died, aged 45 years, at his home in Pittsfield, Massachusetts, March 10. After leaving the rubber industry he removed to the latter mentioned city where he became prominent in insurance, real estate and building lines. He is survived by a wife and three children.

THOMAS KING.

Thomas King, who died recently at the New York Post Graduate Hospital, following an operation, was a veteran employee of the New York Belting & Packing Co., at its factory in Passaic, New Jersey. He was born in Norfolk, Virginia, in 1842, and during the Civil War was a member of the Ninth Virginia Cavalry. Coming north, after the war, he worked in the calender room of The Okonite Co., but for over 25 years has been with the first mentioned concern. He is survived by a widow and two sons, James and William E. King, both of whom are employed by the New York Belting & Packing Co. in its Passaic plant.

JAMES E. BAXTER

James E. Baxter, of the firm of J. E. Baxter & Co., Limited, rubber manufacturers, Leyland, England, died early in February, at his home at Farington, near Preston, Lancaster, England, at the age of 54 years.

Mr. Baxter's connection with the rubber industry began in 1874 with the old firm of Jos. E. Quinn & Co., of Leyland, which, through successive amalgamations, became the Leyland & Birmingham Rubber Co., Limited, with Mr. Baxter as chairman. After about 12 years in this capacity he resigned

in order to establish the concern of J. E. Baxter & Co., Limited, Leyland.

Mr. Baxter was a keen sportsman, and one of the first motor car owners in England. About 14 years ago he took his car to South Africa, making a business tour and paying special attention to the rubber requirements of the gold-mining firms there. It is believed that this arduous trip somewhat affected his health, and possibly may have had



JAMES EDGAR BAXTER.

something to do with his final illness. He was chairman of the Rubber Manufacturers' Association, Manchester, in 1901-1902, and was one of the first rubber manufacturers to take a practical interest in planting rubber in the East, at one time acting as a trustee of the Manchester & North Borneo Rubber Co.

DECEASED RUBBER JOURNALISTS.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

We have read with appreciation your sketch of the late E. Ule, whose death is a loss to the whole scientific world. In connection with it we have the impulse to mention other distinguished men connected with the "Tropenpflanzer," who have passed away within the twelvemonth. For example there was

RUDOLPH ENDLICH

one of the oldest of the "Tropenpflanzer's" contributors, who died in Ghent, Belgium, of appendicitis, while connected with the commissary department of the German army.

Mr. Endlich traveled extensively in Brazil, Paraguay and Argentina, and added to the botanic museum of Berlin a rich collection of exotic plants. His most notable contributions to the "Tropenpflanzer" were: "The Present Condition and the Future of the Guayule Industry" and "The Euphorbia Elastica—A New Rubber Tree."

As plantation manager for the Kilimandjaro Plantation Co. he spent three years in German East Africa, where he laid out a large *Manihot* rubber plantation.

KARL SUPE

Founder and manager of the "Tropenpflanzer," who died on January 27, 1915, at the age of 59, was born in Nuremberg October 8, 1855, and came to Berlin in 1892. He founded the Colonial Commercial Committee, which resulted in 1914 in an organization composed of German princes, scientific institutes, chambers of commerce and of agriculture, colonial and commercial corporations, workmen's unions, missions, etc., all with headquarters in Berlin and branches in German East Africa; an organization of not less than 1,100 commercial, industrial and scientific institutes, corporations and firms.

In 1906 he was prominent in the establishment of the

"cotton commission," and just previous to the war he did the largest part in organizing the production of this most important raw material in the German colonies.

Furthermore, there was

FRANTZ MATTHIESSEN

general secretary of the German Colonial Commercial Committee and editor of the "Tropenpflanzer."

At the beginning of the war he was sent to Königsberg, and then to the frontier as officer of a reserve regiment. He was badly wounded in the chest and legs, and after receiving the Iron Cross died from his wounds in the hospital at Instertburg. He was born in Sablon (near Metz) June 5, 1878, and passed his youth in different parts of the annexed provinces where his father was called by his profession. He graduated in Metz and entered the Kommerz und Diskonto-Bank, Hamburg. After his military service he did not return to banking, but took up botanical work. After graduating as Doctor in Botany (Munich), he obtained employment with the Colonial Committee and later became editor of the "Tropenpflanzer."

ANALYSIS OF POWER COSTS.

The following letter, of interest to manufacturers, has been sent to THE INDIA RUBBER WORLD by a superintendent whose wide experience in rubber factories renders his expression worthy of consideration:

TO THE EDITOR OF THE INDIA RUBBER WORLD:

Every rubber factory, to successfully compete and not suffer by competition, requires a cost system which will tell actual manufacturing costs with promptness and with accuracy. Cost finding is really a very simple matter if one will take the trouble to prepare a system to meet the special factory requirements and then see that the system is kept up.

Most people understand in a general way how to figure the cost of a job that consists principally of labor and material. They may, however, consider the problem difficult when the cost of power and machine time predominates over the wages of hand labor. From the case described below, it will be seen that when the method is once really understood, this problem resolves itself into a very simple matter.

For an example, let us take the milling and mixing of rubber. Making no attempt to give details, I submit the following practical description of the method that is in actual use.

Each purchase of material is manufactured as a separate lot and is so entered in the general as well as the stock ledger account. When entered for manufacture, each job is identified by a separate production number, and all materials and labor used on it are reported on stock requisition slips, or time slips.

All power costs, inclusive of fuel, repairs, depreciation, wages of foremen and engineers, are determined on a monthly basis. The total factory horse-power is divided into separate horse-power units and each power division is assigned an hourly rate in ratio to the total horse-power. It is thus possible to charge each production order with the cost of power employed. At the end of the month the totals of these power charges are checked by the actual power costs. This method is applicable only where it is possible to charge each job as a separate unit.

In the case of a process where it is impracticable to determine the power cost for any particular job, because several are in the works at the same time, the power item, together with superintendence and cost of cleaning machines and surroundings between jobs, are combined into a monthly total. The ratio which this sum bears to the monthly total of productive labor determines the proper amount to charge each job for power cost, according to its share of productive labor.

The foregoing essentials furnish the basis for a monthly statement of profit and loss which can be prepared without taking a physical inventory. In a well-ordered factory these figures for one month should be ready early the next month.

Efficiency is the keynote of present-day industry, and there can be no efficiency without organization. It is the work of the accountant to devise accurate and adequate systems of accounting which will automatically show leakages and fluctuations, thus organizing a business to indicate where costs may be decreased and efficiency increased. The day when a manufacturer can reasonably risk selling on "cost guesses" is over. A knowledge of production costs is absolutely necessary if dividends and surplus are to be maintained.

Under the ordinary plan of accounting, a physical inventory is taken once a year, the books are closed and profit or loss determined. The accuracy of the result is largely based on the correctness of the inventory. This brings about a condition of uncertainty and often exhibits results which come too late for remedy.

An adequate system of cost accounts, free from "red tape" and dealing only with essentials, is the only kind worth consideration. It should harmonize with the general records and provide a perpetual inventory with a statement of profit and loss rendered monthly. Price making by such a system is safe and intelligent. Losses are detected and eliminated, and profit substituted.



KARL SUPE.

The Annual Report of the United States Rubber Co.

THE annual report of President Samuel P. Colt, of the United States Rubber Co., was mailed to the stockholders early this month and shows a most satisfactory condition in the affairs of the company.

Among the interesting features may be noted the increased business of the company and the profits thereon. The net sales during 1915 were more than \$92,000,000, an increase of more than \$9,000,000 over those of the previous year, and as the prices of goods were less than during 1914, the increased volume of goods sold was proportionately greater than is indicated by these figures.

Regarding the net profits of the company, the figures for 1915 were over \$1,800,000 above those of 1914, a most excellent showing. Dividends were paid in full on the preferred stock, and one dividend, amounting to 1½ per cent, was paid upon the common stock.

As was decided the previous year, all export activities were brought under one department, and this move has proven advantageous, the export business during the year amounting to approximately 5 per cent of all the business done.

All will be interested in the note in Colonel Colt's report regarding preparedness. This shows that the company is among the foremost in fostering the movement to place this nation upon a proper basis to meet any international emergency.

It will be noted that the principal factory which is devoted to tires, has been doubled in capacity, while other plants have been enlarged and all are being operated to full capacity.

Last September the directors voted that the stockholders should be furnished hereafter with semi-annual instead of annual reports and, therefore, another report will be issued as of June 30.

The list of directors has been increased to 18 by the election of Edgar B. Davis, Brockton, Massachusetts, who, it will be remembered, was vice-president in charge of the General Rubber Co.'s plantations in Sumatra, and who has traveled extensively over the Malay Peninsula and adjacent territory. Mr. Davis is an authority on rubber planting and is a distinct acquisition to the directorate of the company.

President Colt's report is as follows:
To the Stockholders of the United States Rubber Co.:
In conformity with the by-law which provides that the president "shall make a report in writing to the stockholders at their annual meeting, reviewing the general business and condition of the company," your president submits the following as such report for the year 1915:

The treasurer's report, appended hereto, which is made a part hereof, gives the consolidated general balance sheet as of December 31, 1915, and the consolidated income statement for the year ended December 31, 1915, of the United States Rubber Co. and all its subsidiary companies.

FINANCIAL POSITION OF THE COMPANY.

As a proper safeguard and in view of the floating indebtedness of the company, the policy has been continued of carrying a substantial amount of cash.

During the past year the bonded indebtedness of the company has been modified as follows: Nine million dollars of debenture bonds of the General Rubber Co. (our crude rubber company), which fell due July 1, 1915, were paid by the issue of \$9,000,000 of 5 per cent debenture bonds of the same company, maturing December 1, 1918. Two and one-half million dollars of 5 per cent debenture bonds of the Canadian Consolidated Rubber Co., Limited (whose stock is largely owned by us), maturing December 1, 1918, were issued and sold, and three million dollars of an issue of five million dollars of 5 per cent debenture bonds of Morgan & Wright (our largest tire manufacturing company), maturing December 1, 1918, were sold—the proceeds of the two latter issues being used in reduction of the floating debts and for extensions of the plants of those companies.

The object of having these obligations mature December 1, 1918—that being the date of the maturity of our collateral trust 6s—is that then we may issue one class of security for such amount and on such time as then may seem desirable for the retirement of all these obligations.

VOLUME OF BUSINESS.

The net sales of the company for the year 1915 were \$92,861,015.98, as against \$83,678,812.05 the previous year, or an increase of about \$9,000,000. As the average selling price of rubber goods was less in 1915 than in 1914, the increase in volume of goods sold was proportionately greater than the increase in cash received therefor.

PROFITS AND DIVIDENDS.

The net profits from the business of the year, before deducting interest charges, amounted to \$11,486,704.53; after deducting interest charges the profits were \$8,696,089.15. These profits, if applied in full to dividends, would cover the dividends upon the preferred stocks, and leave a sum equivalent to about ten per cent upon the common stock. Full dividends upon the preferred stocks for the year were paid, and one and one-half per cent was paid upon the common stock in April, 1915. Any further application of profits to dividends under existing conditions would be most unwise and against the permanent interests of all our stockholders.

Indeed, notwithstanding that the earnings of the year have proved to be better than in last July they promised to be, the wisdom of the decision of your directors then made to suspend dividends upon the common stock has been fully justified. Owing to the European war many uncertainties have been created and still exist, notably the uncertainty as to the price of crude rubber and the hazards affecting its transportation to this country. In consequence of prevailing conditions, we have felt it incumbent to purchase a much larger stock of crude rubber than would be necessary in ordinary times, and this alone necessitates the employment of larger quick capital. Moreover, it is most desirable, in connection with the funding of our debt December 1, 1918, that we should continue to strengthen the financial position of the company.

DEPRECIATION.

In addition to maintaining the fixed properties of the company in the highest state of efficiency, and charging the cost of such maintenance to expense accounts, as heretofore, your directors have deemed it wise to apply to the reduction of certain fixed properties, \$2,000,000 of the \$7,000,000 reserved for depreciation, and have further charged \$1,175,479.62 against income on items existing prior to 1915.

BASIS OF INVENTORIES.

Following our usual practice, inventories of manufactured goods and materials have been taken at cost where cost was below market, and at market where market was below cost. Market value of crude rubber and other materials inventoried December 31, 1915, exceeded cost by a substantial amount.

UNITED STATES RUBBER EXPORT CO., LIMITED.

As stated in the report of last year, our export business has been largely consolidated under one organization, and is being satisfactorily expanded under the management of the able men in charge thereof. Our export business the past year has been approximately 5 per cent of our entire business.

UNITED STATES TIRE CO.

The organization of the United States Tire Co., under which we transact our tire business, has been recently enlarged and strengthened. In addition to the distribution of tires through the fifty-one branches of the United States Tire Co., provision has been made for a very much wider distribution than heretofore through the many stores of the United States Rubber Co. The addition to our former brands of tires of the new "Royal Cord" tire and the new non-skid "Go" tire gives us the most complete line of tires manufactured by any company. Our well known "Nobby Tread" and "Chain Tread" are still having a wide and increasing demand, and are acknowledged the best non-skid tires in the market. Our tire sales for January and February of this year show a very large increase over the same period last year.

OUR SUMATRA RUBBER PLANTATIONS.

We have continued the further development of our rubber

plantations in Sumatra during the past year. The amount of crude rubber received therefrom in 1915 was relatively small compared with our requirements, but was in excess of previously estimated production. From now on the increase in production of our Sumatra estates will be rapid as the great number of young trees arrive at the bearing age. I cannot speak too strongly of the efficiency and loyalty of those in charge of our plantations, and so far all their predictions of success have been more than borne out, and the outlook for the future is most flattering.

PREPAREDNESS.

Your directors believe that the unselfish efforts of every corporation are needed to achieve adequate preparedness in the United States, whether for peace or defense. Accordingly they have approved of our employees joining the National Guard, and have agreed to give them the necessary time for camp and other military duties without prejudice to their salaries or to their positions with the company. It is also believed that through the fostering of trade associations and the cooperation of such associations much may be accomplished in the direction of industrial mobilization, without which true preparedness is impossible. Finding that the Navy Department of the United States was in need of some research work in aeronautics, but was without an appropriation for carrying on the investigation, your company volunteered to do this work for the government. This was done, and has proven a useful and practical contribution to preparedness.

THE OUTLOOK FOR THE FUTURE.

At no time in the history of our company has there been greater activity in its business. All our factories are now being operated at full capacity, and steps for enlargement of certain plants and for increase of production are being taken, and the work pushed forward with all dispatch. One of the plants now in process of enlargement is the tire factory of Morgan & Wright at Detroit. This work is under way, and when completed will double the capacity of that plant. Since the beginning of the year a property adjoining that plant has been acquired to better carry out this enlargement.

SEMI-ANNUAL REPORTS.

In accordance with the action taken by the directors on September 16, 1915, the stockholders will be furnished hereafter with semi-annual reports, as of June 30 and December 31.

CONCLUSION.

It again gives me much pleasure to refer to the continued fidelity and ability shown by the officers, heads of departments and employees of the company and its subsidiaries.

TREASURER'S REPORT.

UNITED STATES RUBBER CO. AND SUBSIDIARY COMPANIES.

Consolidated General Balance Sheet, December 31, 1915.

Property, plant and investments, including rubber plantations.....	\$126,347,930.90
Inventories, manufactured goods and material.....	\$39,768,295.27
Cash.....	13,102,407.57
Notes and loans receivable.....	1,562,983.74
Accounts receivable.....	20,820,333.79
Securities, including stock of U. S. Rubber Co. held by subsidiary companies.....	2,272,430.99
Shipping fund cash in hands of trustees.....	476,251.32
Miscellaneous.....	2,200,809.32
	\$80,203,512.50
Total Assets.....	\$206,551,443.40

LIABILITIES.

Capital stock, first preferred.....	\$59,692,100.00
Capital stock, second preferred.....	458,400.00
Capital stock, common.....	36,000,000.00
	\$96,150,500.00
Capital stock, Rubber Goods Mfg. Co.—	
Preferred issued.....	\$10,351,400.00
Owned by U. S. R. Co., deposited with trustees.....	8,862,400.00
	1,489,000.00
Common issued.....	\$16,941,700.00
Owned by U. S. R. Co., deposited with trustees.....	43,300.00
	43,300.00
Minority Canadian Consolidated Rubber Co., Ltd., stock, preferred \$283,665.00, common \$.....	490,200.00
U. S. R. Co.	16,500,000.00
Notes and loans receivable.....	\$9,000,000.00
Accounts receivable.....	2,200,809.32
Shipping fund cash in hands of trustees.....	476,251.32
Miscellaneous.....	2,200,809.32
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	\$80,203,512.50
Total Assets.....	\$206,551,443.40

Canadian Consolidated Rubber Co., Ltd.	2,500,000.00
5% debentures.....	
Morgan and Wright	
5% debentures.....	\$5,000,000.00
Owned by U. S. R. Co.....	2,000,000.00
	3,000,000.00
Mechanical Rubber Co. and New York Belting and Packing Co. bonds.....	791,000.00
	18,858,000.00
Notes and loans payable.....	19,939,709.23
Acceptances for importation of crude rubber.....	\$1,135,601.08
Merchandise accounts payable.....	6,111,514.27
Accrued interest, taxes, etc.....	494,738.92
	7,741,854.27
Reserve for dividends.....	1,200,718.00
Insurance fund reserve.....	\$809,499.27
Employees' accident fund.....	286,110.00
	1,095,609.33
Reserve for depreciation.....	5,000,000.00
Fixed surpluses (subsidiary companies).....	15,080,230.78
Surplus.....	23,962,321.79
Total Liabilities.....	\$206,551,443.40

*Of this surplus \$223,556.55 pertains to minority stock interests.

CONSOLIDATED INCOME STATEMENT FOR YEAR ENDING DECEMBER 31, 1915.

Net sales, footwear, tires, mechanical and miscellaneous.....	\$92,861,015.98
Less:	
Cost of manufacture, selling, general expenses and taxes.....	79,243,881.84
	\$13,617,134.14
Operating profits.....	193,783.92
Other income (net).....	
Total income.....	\$13,810,918.06
Less:	
Cash discount allowed customers for prepayment (net).....	\$1,766,639.77
Deductions for bad debts.....	375,252.85
Federal income tax, 1915.....	182,300.91
	2,324,213.53
Net income prior to interest charges.....	\$11,486,704.53
Interest on loans, notes and accounts payable.....	1,083,927.72
Interest on funded debt.....	1,706,687.66
	\$8,696,089.15
Net Profit.....	\$3,790,615.38
Income credits applicable to period prior to 1915.....	836,971.31
	\$9,531,060.46
Income charges applicable to period prior to 1915.....	1,175,479.62
	\$8,355,580.84
Net Income.....	\$1,175,479.62
Dividends—United States Rubber Co.	
1st preferred, 8%.....	\$4,764,632.00
2d preferred, 6%.....	30,906.00
Common (April, 1915).....	540,000.00
	\$5,335,538.00
Dividends to minority stockholders of subsidiary companies.....	139,995.00
	\$5,475,533.00
Surplus for period.....	\$2,882,047.84
Surplus beginning of period.....	\$20,065,322.75
Additions to surplus:	
Capital gain in conversion of second preferred into first preferred stock.....	25,000.00
Adjustment applicable to prior year.....	49,951.20
	20,080,273.95
Surplus, December 31, 1915.....	\$22,962,321.79

Respectfully submitted,
W. G. PARSONS, Treasurer.

ANNUAL ELECTION.

BOARD OF DIRECTORS FOR 1916

The annual meeting of the stockholders of the company was held at New Brunswick, New Jersey, March 22, and the following directors were elected:

Walter S. Ballou, Providence, R. I.
James C. Brady, New York City.
Nicholas F. Brady, New York City.
Middleton S. Burrill, New York City.
Samuel P. Colt, Providence, R. I.
Harry E. Converse, Boston, Mass.
Edgar B. Davis, Brockton, Mass.
James Deshler, New Brunswick, N. J.
James B. Ford, New York City.
Francis L. Hine, New York City.
Henry L. Hotchkiss, New Haven, Conn.
Lester Leland, Boston, Mass.
Samuel M. Nicholson, Providence, R. I.
Raymond B. Price, New York City.
Homer E. Sawyer, New York City.
William H. Truesdale, Greenwich, Conn.
Theodore N. Vail, Boston, Mass.
Elisha S. Williams, New York City.

OFFICERS.

At a meeting of the board of directors on March 23 the following officers were elected for the ensuing year:

Samuel P. Colt, president.

James B. Ford, vice-president.

Lester Leland, vice-president.

Ramond B. Price, vice-president (Development Department).

Homar E. Sawyer, vice-president (Footwear Department).

Elisha S. Williams, vice-president (Mechanical Department).

J. Newton Gunn, assistant to president.

Samuel Norris, secretary.

John D. Carberry, assistant secretary.

W. G. Parsons, treasurer.

E. J. Hathorne, assistant treasurer.

EXECUTIVE COMMITTEE.

Samuel P. Colt, James B. Ford, Lester Leland, Walter S. Ballou and Nicholas F. Brady.

MEETING AND BANQUET OF NATIONAL ASSOCIATION OF WASTE MATERIAL DEALERS.

THE third annual meeting of the National Association of Waste Material Dealers was held at the Hotel Astor, New York City, March 15. President Louis Birkenstein called the meeting to order at 11 A.M. The minutes of the last meeting and the reports of the secretary and treasurer were read and approved.

The chairmen of the different divisions then submitted reports that reflected the very favorable conditions now existing in the trade. The Rubber Scrap Division recommended certain changes in the circular for packing which will be revised and hereafter known as Circular B. Item No. 4, covering standard automobile tires, now reads practically as follows: "Must be free of unguaranteed tires, heavy headed tires, filled tires, burned or overcured and oxidized, single tube, stripped, badly worn, leather or metal."

The report of the committee to arrange for new and larger quarters reported the establishment of new offices at 185 Summer street, Boston, Massachusetts. The invaluable service rendered by the traffic committee during the past year was called to the attention of the members by the president, and a vote of thanks extended to the chairman for his good work. President Birkenstein and Secretary Haskins then read their annual reports, which were received with marked appreciation and approved in due form.

The nominating committee then submitted the following ballot for officers and directors for the ensuing year:

Louis Birkenstein, president; H. H. Cummings, first vice-president; James Rosenberg, second vice-president; William Van Der Koogh, third vice-president; Edward A. Stone, fourth vice-president; Henry Lissberger, fifth vice-president; Newell J. Lewis, sixth vice-president; Chas. M. Haskins, secretary; Mark Sherwin, treasurer. Directors: Simon Weil, Leo Loeser, F. W. Reidenbach, R. D. Cunningham, Herman Sonken, Ike Grodin, R. M. Milligan, Paul Loewenthal, Ivan Reitler.

The secretary was authorized to cast one ballot for each of the selections made, which he did, and the president declared elected the officers and directors as nominated.

Thus the third year of the National Association closed with most gratifying results to everyone. The association now has 110 members and has accomplished inestimable benefit for the waste trade, showing a development in growth and influence that has been felt in every branch of the business. Much praise is due the worthy president of the association, Louis Birkenstein, now elected for the third time. Much credit is due him for the progress, growth and accomplishment during the past year, and it is a source of satisfaction that Mr. Birkenstein has consented to serve for the ensuing year.

THE BANQUET

In the evening about 230 members and guests assembled in the north ballroom of the Hotel Astor to participate in the third annual banquet. The hall was appropriately decorated with American flags and the flowers and table decorations tastefully arranged. Each member and guest received a souvenir in the shape of a small silk American flag.

There was orchestral music, popular songs and a mixed quartette to entertain the company while the courses were served. Following President Birkenstein's address, the speaker of the evening, Nathaniel Elsbet, congratulated the members on the success of the association.

Interesting talks were given by other speakers, who entertained the members until the small hours of the morning. The banquet was pronounced a most enjoyable affair by everyone there.

MANUFACTURERS OF TIRE FABRICS EXPAND.

The recent expansion of the Connecticut Mills Co. and Canadian Cotton Mills, Limited, again emphasizes the steady growth of these allied concerns. The Connecticut Mills Co. was organized in 1910 at Danielson, Connecticut, and the Canadian Connecticut Cotton Mills, Limited, controlled by the same group, followed in 1913. Each year since the Connecticut Mills Co. was first put into operation it has been found necessary to make extensions in the plant to accommodate increasing business.

The reorganization of the Connecticut Mills Co. has just been effected, whereby the capital becomes \$1,000,000, and provision has been made for a thirty-thousand-spindle spinning plant, which, however, will only supply a part of the Connecticut Mills Co.'s requirements. Other units will follow later at Danielson, Connecticut, where the company's plant is located, and is the largest factory in the town.

The Canadian Cotton Mills, Limited, located at Sherbrooke, Province of Quebec, has just had its capital increased to \$1,500,000 to finance an extension, tripling the capacity of the plant in anticipation of the future of Canada. The Sherbrooke company does all of its own spinning and enjoys the distinction of being at the same time the youngest member of the manufacturing circle of that city, and the largest. The products of both of these mills have been foremost in the market on the score of quality and are favorably known to every large user.

The men directing the affairs of both companies are Tracy S. Lewis, R. J. Caldwell, H. L. Burrage and O. Butler. To this staff has just been added the name of L. W. Cuddy, formerly of New Bedford. The selling agent is R. J. Caldwell of 15 Park Row, New York City.

The Dunlop Rubber Co. has recently completed the installation of a tire manufacturing plant at Melbourne, Australia, said to be the largest in the southern hemisphere. It is stated this plant will employ 1,400 hands, and it will manufacture many of the English specialties of the parent company.



LOUIS BIRKENSTEIN.

News of the American Rubber Trade.

ANNUAL STATEMENT OF THE HOOD RUBBER CO.

THE annual statement, recently issued, shows the condition of the company on December 31, 1915. The important items are given in the condensed balance sheet shown below:

CONDENSED BALANCE SHEET. December 31, 1915.

ASSETS.	
Plant (real estate, machinery, etc.)	\$2,425,000.00
Merchandise	1,361,826.30
Accounts receivable	3,138,887.99
Cash	338,341.98
Investments in other corporations	189,800.00
Patents	1,000.00
	\$7,354,850.27
LIABILITIES.	
Capital Stock—Common	\$2,000,000.00
—Preferred	2,500,000.00
	\$4,500,000.00
Notes payable	1,580,000.00
Surplus	1,274,850.27
	\$7,354,850.27

Merchandise in process of importation and letters of credit in connection therewith are not included in the foregoing statement.

MIDGLEY COMPANY CHANGES NAME AND ENLARGES CAPITAL.

At a special meeting of the stockholders held recently, the name of the Midgley Tire & Rubber Co., of Lancaster, Ohio, was changed to the Lancaster Tire & Rubber Co. The capital stock was increased from \$550,000 to \$850,000, the increase being 7 per cent. cumulative stock.

The new directors are:

F. A. Miller, Columbus, Ohio, general manager of the H. C. Godman Shoe Co.

H. B. Peters, Lancaster, Ohio, president of the Fairfield National Bank.

C. S. Hutchinson, Lancaster, Ohio, assistant secretary of the H. C. Godman Shoe Co. and vice-president of the Lancaster National Bank.

Harry Davis, Pittsburgh, Pennsylvania, president of the Harry Davis Enterprises.

E. E. Lerch, Columbus, Ohio, secretary of the H. C. Godman Shoe Co.

H. V. Blaxter, Pittsburgh, Pennsylvania, of Lazier & Blaxter, attorneys at law.

J. T. Rose, Lancaster, Ohio, president of the Lancaster Tire & Rubber Co.

The officers of the company are:

J. T. Rose, president.

C. S. Hutchinson, vice-president.

G. A. Stephenson, secretary and treasurer.

Walter H. Hermann, factory manager.

T. B. Davies, manager of sales.

Orders for additional equipment for the making of full molded tires have been placed; presses have been purchased, and within the next 60 days the company will be producing, in addition to its present product, wrapped wire tread and plain tread tires, full molded plain and non-skid tires and a complete line of inner tubes.

CANADIAN CONSOLIDATED RUBBER CO. ACTIVITIES.

During the past month a shipment of 1,000 hot water bottles was sent by the Canadian Consolidated Rubber Co., Montreal, Canada, to the Queen's secretary at Buckingham Palace, London, England, for distribution through the military hospitals of England. These bottles were provided from the proceeds of a special fund instituted through the efforts of Mrs. L. Mitchell-Henry, of Montreal, and funds for further shipments are being collected. This company has reopened and remodeled the factory of the Granby Rubber Co., Granby, Quebec, for the manufacture of a

general line of rubber footwear. C. K. Hutchinson is factory manager.

GOODRICH ANNUAL MEETING.

At the annual meeting of stockholders of The B. F. Goodrich Co., held at the company's office in New York City on March 8, the following five directors whose term expired this year were re-elected for a period of three years: C. C. Goodrich, F. H. Mason, W. A. Means, A. H. Noah and Guy E. Norwood. Provision was made for four additional directors, increasing the board membership from 14 to 18. The following directors were elected to fill the new places on the board, also the vacancy caused by the resignation of A. H. Wiggin: W. O. Rutherford, A. B. Jones, Dr. W. C. Geer, H. E. Joy, H. K. Raymond. The directors also re-elected the old officers.

The stockholders in a special meeting authorized the reduction of the authorized preferred capital stock from \$28,000,000 to \$27,300,000.

The quarterly dividend of 1 per cent on the common stock was declared, payable May 15 to stockholders of record May 4.

RUBBER COMPANY DIVIDENDS.

The Boston Woven Hose & Rubber Co. paid the regular dividend of 3 per cent on March 15 to stockholders of record March 6.

The usual quarterly dividend of $1\frac{1}{4}$ per cent on the preferred stock of the Republic Rubber Co. was paid March 1.

The Rubber Goods Manufacturing Co. paid the regular quarterly dividend of $1\frac{1}{4}$ per cent on its preferred stock March 15 to stockholders of record March 10.

A quarterly dividend of $1\frac{1}{4}$ per cent on the preferred stock of the Plymouth Rubber Co. was paid March 1.

A quarterly dividend of $1\frac{1}{4}$ per cent on the 6 per cent preferred stock of the Kelly-Springfield Tire Co. has been declared, payable April 1, to stockholders of record March 18.

The Goodyear Tire & Rubber Co. has declared a quarterly dividend of $1\frac{1}{4}$ per cent on its preferred stock, payable April 1.

The regular quarterly dividend of the Boston Belting Co., \$2 a share, will be paid on April 1.

The Firestone Tire & Rubber Co. has declared a quarterly dividend of $1\frac{1}{4}$ per cent on preferred and 5 per cent on common stock, both payable April 15 to stockholders of record April 1.

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of shares of rubber manufacturing companies on March 25 are furnished by John Burnham & Co., 115 Broadway, New York City, and 40 South La Salle street, Chicago, Illinois:

	Bid.	Asked.
Axax Rubber Co., common	68 $\frac{1}{2}$	70 $\frac{1}{2}$
Firestone Tire & Rubber Co., common	74 $\frac{1}{2}$	75 $\frac{1}{2}$
Firestone Tire & Rubber Co., preferred	113	
The B. F. Goodrich Co., common	72 $\frac{1}{2}$	73 $\frac{1}{2}$
The B. F. Goodrich Co., preferred	114	116
Goodyear Tire & Rubber Co., common	340	345
Goodyear Tire & Rubber Co., preferred	112	116
Kelly-Springfield Tire Co., common	74 $\frac{1}{2}$	75 $\frac{1}{2}$
Kelly-Springfield Tire Co., first preferred	96	98
Kelly-Springfield Tire Co., second preferred	96	
Miller Rubber Co., common	234	240
Miller Rubber Co., preferred	112	116
Portage Rubber Co., common	72	
Portage Rubber Co., preferred	106	107
Rubber Goods Manufacturing Co., preferred		
Swinchart Tire & Rubber Co., common	88	90
United States Rubber Co., common	82 $\frac{1}{2}$	83 $\frac{1}{2}$
United States Rubber Co., preferred	109	111

WILLIAM J. KELLY.

HAS anybody here seen Kelly?

In response to this orchestral query, a big-boned, rangy American, with a look of eager youthfulness contradicting the gray in his close-clipped hair, rises, bows to right and left, and one of the old-time customs of a Rubber Club dinner is complete. Needless to say this is William J. Kelly, known to the rubber trade far and wide.



WILLIAM J. KELLY.

To quote one of his own biographical phrases: "I came within three days of being born a fool," which means that he first saw the light on April 4, the year being 1861. His home was in Old Roxbury, Massachusetts, just a few doors from that of the late Charles H. Arnold.

It was quite natural, as the boys grew up together and attended the same schools, that when they came together in business later in life, there should have been a very strong bond of affection between them. Young Kelly showed his first interest in rubber when as a boy he often strayed to the Boston Belting Co.'s factory in Roxbury, and wheedled bits of pure rubber from the workmen to use as chewing gum. In 1880 he secured a position with Henry A. Gould in his Boston office. Later he went with Geo. A. Alden & Co., and in 1903 became associated with his old friend Charles H. Arnold, first as a rubber salesman, and a successful one, and later as a member of the firm of Arnold & Zeiss. He is known from one end of the country to the other, is popular, respected and successful. Incidentally, Mr. Kelly is something of a golfer, an enthusiastic baseball fan, and one of the fathers of the Rubber Club.

AN IMPORTANT TRADE-MARK DECISION.

The decision of the District of Columbia Court of Appeals in sustaining the decision of the commissioner of patents in *ex parte* United Drug Co., according to the "Bulletin of the United States Trade-Mark Association," establishes a precedent which may easily be the cause of far-reaching confusion in commercial fields as to what constitutes unfair competition. The United Drug Co. attempted to register the word "Stork" as a trade-mark for rubber nipples, and the commissioner refused registration because of the existence of the Stork Co., a corporation engaged in the manufacture of waterproof goods, although the latter company does not make rubber nipples and does not oppose the registration of the word by the United Drug Co.

The American consulate at Mombasa, Africa, desires to receive from American manufacturers and exporters, catalogs of rubber goods for its commercial library and reading room.

PERSONAL MENTION.

Harvey S. Firestone, president of the Firestone Tire & Rubber Co., Akron, Ohio, left for Florida late last month, where he will remain for a few weeks.

W. H. Bell has been made manager of the Chicago, Illinois, district by the Kelly-Springfield Tire Co., New York City, having formerly managed the company's Pacific Coast territory.

J. E. Redman has been made assistant sales manager of the Chicago, Illinois, territory by the Michelin Tire Co., Milltown, New Jersey.

Frank C. Stover, formerly of the Star Electric Co., Chicago, Illinois, has been appointed manager of the municipal department of the United States Tire Co., with headquarters at 1222 Michigan avenue, Chicago.

Franklin Kesser, well known in the tire trade, has recently become Eastern district manager of the Batavia Rubber Co., with headquarters at their New York branch, 1906 Broadway. Mr. Kesser's experience covers a period of ten years as manager of the Hartford Rubber Works Co.'s branch in Philadelphia; five years in an executive capacity at the Hartford factory; three years in executive positions with Akron tire companies, and for the past year jobbing representative of the Batavia Rubber Co. for the Philadelphia market, which experience entitles him to be called one of the deans in the tire world.

Ernest Brandt has become connected with the Ajax Rubber Co., Inc., New York City, to assist J. C. Matlack in the conduct of the sales department. Mr. Brandt was with the Hartford Rubber Works Co. for many years, later joining the Fisk Rubber Co. in an important capacity. He then became sales manager of the Corbin Motor Vehicle Co., was one of the district managers of the United States Motor Co., and, still later, eastern district manager for the Hudson Motor Car Co.

Charles G. McCullough, New York manager for the Pennsylvania Rubber Co., Jeannette, Pennsylvania, is engaged to marry Miss Isabelle Matlack, daughter of J. C. Matlack, sales manager of the Ajax Rubber Co., Inc., New York City.

E. B. Sigerson has been appointed manager of the Buffalo branch of the Goodyear Tire & Rubber Co., Akron, Ohio. In 1910 Mr. Sigerson joined the Goodyear forces as salesman in the New England district. Since then he has risen by rapid stages to his present post.

FOUNDER OF BATAVIA RUBBER CO. RETIRES.

Ashton W. Caney, president and active manager of the Batavia Rubber Co., Batavia, New York, and one of the original incorporators, retired from an active position with the company on March 1, having sold the greater portion of his stock. He will, however, still be connected with the company as a member of the board of directors.

Mr. Caney came to Batavia 29 years ago, and has been a prominent figure in its industrial affairs ever since. He has been actively engaged in the rubber industry for 17 years. In 1900 he became interested in the Batavia Rubber Tire Co., introducing the Sweet patent solid rubber carriage tire. The business was successful and in connection with the Batavia Carriage Wheel Co. it was sold to the Standard Anti-Friction Co. of New York. Mr. Caney remained with the latter company until August 1, 1902, when he resigned as manager of the rubber department and, with other Batavians, organized the Sweet Tire & Rubber Co., of Batavia. In 1908 the property of this company was sold to a representative of the present Batavia Rubber Co., which was formed by Mr. Caney, and a number of other officers of the old concern.

BLOOMINGDALE RUBBER CO. BUYS S. & L. PLANT.

The Bloomingdale Rubber Co., reclaimers, with general offices in the Singer Building, New York City, and works at Butler, New Jersey, purchased on December 17, 1915, at receiver's sale, the entire plant and assets of the S. & L. Rubber Co., Chester, Pennsylvania, for \$34,825, estimated to be one-third the actual value of the plant.

The Chester plant has a capacity of eight to ten tons per day, according to the kind of scrap reclaimed. It is located on the Delaware River and occupies an area 180 x 1,400 feet, adjoining the Pennsylvania and the Philadelphia & Reading railroad tracks, sidings from both roads running into the grounds of the plant. The Bloomingdale company's business having outgrown its Butler establishment, it is intended to run both plants. Alterations at Chester are now completed and the plant is running 20 hours a day.

AMERICAN CHICLE CO.

The full list of officers recently chosen by the directors of the American Chicle Co. includes Darwin R. James, president; Silas B. Adams, vice-president; M. D. Bromberg, secretary; F. A. Hubbard, treasurer. Walter Bauer is general manager, in charge of production, and George W. Hopkins, formerly vice-president of the Loose-Wiles Biscuit Co., has taken the position of general sales and advertising manager. This company manufactures over 100 brands of chewing gum, having factories in 10 American cities, and one each in Toronto, Canada, and London, England. It owns its chicle plantations, located in Yucatan.

AN INNOVATION IN SALES PLANS.

The United States Rubber Co., New York City, is equipping its footwear salesmen with an outfit which should prove of interest to all their customers. A neat package contains a folding stereoscope of aluminum and two sets of photographs, one of which comprises views taken at one of the large footwear factories of the company, and showing every process in detail of manufacturing boots and shoes. The other set represents a little journey to the National India Rubber Co.'s factory and illustrates the manufacture of sporting and outing shoes. Each of these sets consists of 50 stereoscopic views, and these are accompanied by a little address which the salesman is supposed to deliver in explanation of the photographs as they are presented one after another in the stereoscope. This practically takes the customer through the mills, showing him exactly each step in manufacture, and is really almost as good as a journey to Naugatuck, Malden, New Haven, Bristol, or to some other mill of the company. It should certainly hold the customer's attention and enlarge his knowledge of the "how" of rubber footwear production. As a selling proposition, it is an experiment which will be watched by manufacturers in other lines of business, with a view to determining its success.

RUBBER SOLED SHOES SAVED A LIFE.

A peculiar accident is reported in a technical paper on "Safety in Stone Quarrying," issued by the Bureau of Mines, Washington, District of Columbia. A transformer supplying a stone quarry burned out, permitting 4,000 volts to pass to the hoisting motors. The man in charge placed his hand on the lever, and as the machine was electrically charged he could not let go. As he was wearing rubber-soled shoes he sustained no injury. He called for help, and the man who came to his assistance, instead of pulling the switch and cutting off the current, took hold of the engineer's hands and tried to pull them free, and in so doing completed the circuit and was killed. The man with the rubber-soled shoes was uninjured except for slight burns.

TRADE NOTES.

The Beacon Falls Rubber Shoe Co., Beacon Falls, Connecticut, has leased the entire building at 106 Duane street, New York City, for their New York office, having formerly occupied only a part of it. The extended quarters will be thoroughly remodeled.

To care for its growing business in Canada, the F. S. Carr Co., Boston, Massachusetts, has purchased the factory property, including equipment, formerly owned by the Walpole Rubber Co., Limited, Granby, Quebec.

The Southwark Foundry & Machine Co., Philadelphia, Pennsylvania, has nearly quadrupled its capacity and is now very busy, especially in the manufacture of hydraulic presses and turbines. Machinery costing \$250,000 has already been installed and about as much more is contracted for, in order to bring the plant up to its proposed capacity.

J. E. Gramlich, formerly engineer and superintendent of the Chase Motor Truck Co., Syracuse, New York, has become associated with the Thermoid Rubber Co., Trenton, New Jersey, as engineer. Mr. Gramlich will give exclusive attention to the development of the lately patented Thermoid-Hardy Laminated Disk, for which this company has the exclusive American rights.

The Ideal steering device, a recent addition to the numerous specialties designed for Ford cars, is made by Charles E. Miller, Anderson Rubber Works, Anderson, Indiana.

A contract has been awarded to the New Jersey Car Spring & Rubber Co., Jersey City, New Jersey, by the fire department committee, Pittsfield, Massachusetts, for 1,100 feet of hose, at a price of 67 cents a foot.

The number of stockholders of the United States Rubber Co., New York City, on January 15 totaled 16,636, as compared with 15,572 on January 15, 1915.

The Aetna Rubber Co., Cleveland, Ohio, has sold its Perkins avenue property to the Ford-Clark Co., and will build a new plant on East Seventy-ninth street. The foundation is started, and the plans are for a three-story building 55x140 feet, with an addition of 50x60 feet. The new factory will be equipped with the latest improved type of machinery for the manufacture of electricians' and acid-proof gloves.

The De Silva Rubber Co., 310 East Seventy-fifth street, New York City, manufacturer of rubber heels and other mechanical goods and specialties, is building a two-story factory, 60x70 feet, on Harris avenue, Long Island City, New York.

The Canton Rubber Co., Canton, Ohio, has recently removed its New York City offices from 1326 Broadway to quarters at 240 Broadway, where the premises now occupied are three times the size of the former offices. L. P. Jones is manager.

The Warren Cotton Mills, West Warren, Massachusetts, will erect a two-story addition to its dyehouse and make alterations on the adjoining building. The addition will be approximately 114 x 36 feet; the foundation will be of concrete, and there will be a reinforced concrete floor and a tar and gravel roof. Work will be started immediately and will be completed within about two months. This corporation manufactures, besides other cotton fabrics, goods for mackintosh linings, etc.

Canadian Consolidated Rubber was selling at 91 when the war started, and there it remained until the middle of the month, when 99 was bid and 105 asked, with no sales reported. The last dividend on the common was paid October 1, 1914, and it is thought that the unusual demand for its products, in the regular trade, as well as its army contracts, make this rise in the value of its stock justifiable. The annual meeting takes place early next month.

PERSONAL MENTION.

David L. Kubie, son of Samuel Kubie, president of the Raw Products Co., has been elected secretary and director of the company. Mr. Kubie was formerly identified with the Raw Products Co., but resigned for the purpose of making an outside connection. His preference for the rubber business was stronger than for any other line, consequently he has returned to the fold. He will represent his father in a great many transactions to which Samuel Kubie previously had to give personal attention. The young man matriculated at the Wharton School of Finance, University of Pennsylvania. He made an excellent record from both a scholastic and athletic standpoint.

A party, consisting of directors and guests of the Atlantic Coast Lumber Corporation and United Timber Corporation, including Colonel Samuel P. Colt, Francis Lynde Stetson, James B. Ford, Lester Leland, John D. Carberry, M. J. Quinn, R. J. Clifford, E. J. Hathorne, Walter S. Ballou, H. Stuart Hotchkiss, United States Senator LeBaron B. Colt and Edgar B. Davis, left last week in private cars over the Pennsylvania Railroad via Atlantic Coast Line, for Georgetown and Charleston, South Carolina, on a tour of inspection of the various properties in South Carolina in which they are interested.

George B. Hodgman of the Hodgman Rubber Co., Tuckahoe, New York, returned March 21 from a three-weeks' visit to Bermuda.

John Scott McClurg, president and general manager of the McClurg Rubber Co., Coshocton, Ohio, was married on February 23 to Mrs. Anna Barry Cunningham.

W. H. Palmer, for several years in charge of the advertising department of the United States Rubber Co., New York City, has assumed a new position in the sales department and will devote his efforts to the development of the canvas rubber sole shoes manufactured by the company. L. E. Seddon, formerly assistant cashier, succeeds Mr. Palmer as manager of the advertising department.

The New Jersey Zinc Co., New York City, announces the appointment of A. H. Peck as sales manager, in place of Alfred W. Dodd, resigned, and E. V. Peters as assistant general sales manager.

Announcement has been made of the promotion of A. M. Jack to manager of the Pittsburgh branch of The B. F. Goodrich Co. Mr. Jack, whose home is in Dayton, Ohio, was engaged in newspaper work several years. For six months he was court reporter for the old "Dayton Press"; later he did reportorial work in Cincinnati for eight years. Ten years ago Mr. Jack was admitted to the Ohio bar, and he has been employed by the Goodrich company for the past five years, during which time he has made steady advance to his present position as manager of the Pittsburgh office of the company.

J. E. Duffield has become identified with the United States Rubber Co. interests as sales manager for the Mechanical Rubber Co., Chicago, Illinois. Mr. Duffield's activities as western manager for the Thermoid Rubber Co. have made him well known in Chicago.

W. F. Bilger, for a number of years advertising manager of the T. Eaton Co., Limited, Toronto, Canada, succeeds R. W. Ashcroft as advertising manager of the Canadian Consolidated Rubber Co., Limited, Montreal.

Nathan Owitz, sales department of the Wheeler Condenser & Engineering Co. of Carteret, New Jersey, has been elected sales manager of the J. P. Devine Co. of Buffalo, New York.

Mr. Owitz has been with the Wheeler company for 11 years; 5 years at their general office and works at Carteret, 2 years as manager of their Cincinnati district, 2 years as their Pittsburgh district manager, and manager of the Philadelphia territory for

1914 and 1915, handling their entire line of equipment; an experience which will qualify him for his new position.

Frederick C. Hood, vice-president and general manager of the Hood Rubber Co., Watertown, Massachusetts, will spend a few weeks at Bermuda early in April.

Dr. Eugenio Dahne, who has planned a remarkable exhibit of Brazilian products at the Panama-California Exposition, San Diego, California, leaves on the "Vestris" for Brazil on April 1. The doctor has been somewhat handicapped by the blocking of the Panama Canal. Only a part of the notable exhibit has arrived, therefore, with characteristic energy, he is going after it, and undoubtedly he will come back with shiploads of coffee, rubber and a great variety of interesting Brazilian products.

William L. Wadleigh, of Wadleigh Co., Limited, Singapore, Straits Settlements, who has been in Malaya since November of last year, starts for home April 8 by the Pacific route. He ought to arrive in New York by the first of May, and will certainly receive a warm welcome from his many friends.

Russell W. Earle has retired from the firm of Earle Brothers, crude rubber dealers, 66 Broad street, New York City. The business will be continued at the same location, under the same firm name, by William P. Earle, Harry W. Laird, William P. Earle, Jr., and Everett W. Laird.

J. F. Douse, for many years in the tire business with headquarters in San Francisco, California, recently assumed the management of the Seattle, Washington, branch of the Fisk Rubber Co., Chicopee Falls, Massachusetts.

RUBBER MEN ESCAPE IN SUSSEX DISASTER.

Among the passengers on the steamer *Sussex*, damaged by explosion in the English Channel, were president of the United States Rubber Export Co., and Francis E. Drake, European manager of that company, both of whom had exciting experiences. We are pleased to record that both gentlemen escaped injury. Mr. Huxley gave one of the clearest and most graphic accounts published of the explosion and the excitement which followed, and the many details mentioned by him show him to be a close observer. His story of the affair was cabled by the Associated Press to all the leading papers in this country.

Another passenger on the *Sussex*, who, however, did not escape so easily, was Joshua D. Armitage, of Taylor, Armitage & Co., of New York City. Great anxiety was felt by his partners and friends at first, because of the absence of any word regarding him, but later reports stated that he was suffering from shock and bruises, but was not seriously injured.



EDWARD H. HUXLEY

BRAZIL AIDS TRAVELLING SALESMEN.

The annoying delay occasioned by the customs officials of Brazil in entering and releasing traveling men's samples is well known to the fraternity. Recent legislation has been enacted through the efforts of Ambassador Morgan, whereby in place of the usual duty, 5 per cent is levied on the value of the samples according to the accompanying consular invoice. Advertising samples will pay regular duties less 50 per cent.

The Fifth National Textile Exhibition will be held in Mechanics' Building, Boston, April 24 to 29, and the National Association of Cotton Manufacturers will hold its 100th meeting at Copley Plaza Hotel during the same week. Many men well known to tire manufacturers will participate.

NEW INCORPORATIONS, WITH AUTHORIZED CAPITAL, ETC., 1916.

Amazon Tire & Rubber Co., The, February 29 (Ohio), \$100,000. Louis J. Shott, C. E. Bettler, L. F. Smith, E. H. Clinedinst and Frank B. Burch.

American Aircraft Co., Inc., March 21 (New York), \$10,000. Ladislaus Von Keviczky, 181 Claremont avenue, Joseph C. Kadane, Broadway, and Henry Waldman, 778 Prospect avenue, all of New York City. To manufacture aerial craft of every kind.

Baltimore Rubber Tire Manufacturing Co., February 18 (Maryland), \$200,000. William-Albert S. Mauk, Orangeville, Baltimore County, George W. Habberset and Harry W. Reeve—both of Baltimore City,—both in Maryland. Office, Baltimore City, Maryland. To manufacture automobile tires.

Banner Tire & Supply Co., The, February 8 (Ohio), \$250,000. T. J. Mills, F. L. Woodbridge, Charles A. Wobbe, S. W. Kirts and J. O. Crawshaw.

Bartlett-Yates Insulation Co., Inc., The, March 17 (New York), \$10,000. Henry N. and Bertha L. Bartlett, both of 312 Park street, Westfield, New Jersey, and John S. Yates, 381 West End avenue, New York City. Electrical supplies, insulating materials, etc.

Bentley-Eves Rubber Co., February 25 (Illinois), \$15,000. W. A. Bentley, Roy Physioc and Henry L. Blum. Office, 142 West 27th street, Chicago, Ill. To manufacture and deal in tires, casings, tubes, automobile accessories, etc.

Burke, Inc., Walter V., March 21 (New York), \$1,000. Walter V. Burke, 241 West 54th street, Thomas F. MacMahon and Bailey C. Elliott, both of 1400 Broadway, both in New York City. To manufacture auto tires, etc.

Fellsen Tire Co., Inc., The, March 21 (New York), \$10,000. William N. and Carmen V. Callahan, both of 171 West 71st street, and John McEwan, 61 East 76th street, both in New York City. Auto tires, etc.

Firestone Tire & Rubber Co., March 4 (Maine), \$50,000. George S. Soule (president), South Portland, J. P. O'Donnell (treasurer), and James E. Manter (clerk), both of Portland, both in Maine. Office, Portland, Maine. To manufacture and deal in tires, rubber hoof pads, etc.

Luck Tire & Manufacturing Co., The, March 1 (Delaware), \$500,000. D. A. and C. M. Walker, both of San Antonio, Texas, and C. J. Davis, East Palestine, Ohio. Office, 311 South State street, Dover, Delaware. To manufacture and deal in tires, tubes and automobile accessories.

Mason Motor Car Co., Inc., March 7 (New York), \$30,000. Norris N. Mason, Waldo avenue, Arthur W. Logan, Bayside avenue, both in Bayside, Queens, New York; and Julia Ward, 16 East 48th street, New York City. Office, 1746 Broadway, New York City. Motor cars, tires, etc.

Millbury Rubber Goods Co., Inc., March 21 (New York), \$50,000. Edward E. Reardon, 246 East 49th street, Edward J. Rathens, West 204th street and Harlem River, both in New York City, and Irving V. W. Williams, 661 Madison street, Brooklyn, New York. To manufacture tires, etc.

Modern Tire & Repair Co., February 5 (Texas), \$25,000. F. M. Van Brunt, T. E. Armitage and E. E. Patterson, all of Houston, Texas. Office, Houston, Texas. To deal in tires, tubes and automobile accessories.

Mohawk Valley Supply Co., Inc., March 1 (New York), \$100,000. Charles O. and Josephine B. Terwilliger, and Ethel H. Plumb, all of Herkimer, New York. Auto tires and accessories.

Moore Braiding Co., Inc., March 6 (New York), \$3,000. John V. and George C. Moore, both of Westerly, Long Island, and Edward Weintraub, 151 Second avenue, New York City. To manufacture elastic cords, etc.

Motor Accessory & Tire Co., The, January 13 (Colorado),

\$50,000, divided into 50,000 shares of one dollar each. A. V. Fagerstrom, R. J. Weaver and W. T. Mathis, all of Pueblo, Colorado. To deal in tires, tubes, sundries, etc.

Motor Tire & Accessories Co., March 6 (Delaware), \$75,000. W. H. and A. H. Sponsler, and W. A. Sponsler Jr., all of New Bloomfield, Pennsylvania. Office, Equitable Building, Wilmington, Delaware. To manufacture automobiles and supplies for same.

National Rubber & Specialties Co., The, March 2 (Ohio), \$25,000. J. E. Bancroft, G. M. Allen, Gustave W. Drach, C. L. Bonifield and H. L. Gordon. To manufacture vulcanizers and specialties.

Overland Tire & Rubber Co., Ltd., February 22 (Canada), \$50,000, divided into five hundred shares of one hundred dollars each. John Joseph O'Reilly, Neil Francis MacNeil, William Raymond MacKay, Julius Duce-Luce and William Henry Wickham. Office, Montreal, Quebec. To manufacture and deal in rubber, tires, tire fabrics, etc.

Paige & Co., Inc., H. Ray, March 24 (New York), \$100,000. Albert T. Maurice, Rye, New York, Paul B. Barringer Jr., 4 West 53rd street, and Samuel Kaltman, 532 West 152nd street—both in New York City. To manufacture auto tires, rubber goods, etc.

Perlman Rim Corporation, March 15 (New York), \$500,000. Jerome A. Lederman, Edward H. Kelly and Ralph G. Coad, all of 43 Cedar street, New York City. Tires, rims, auto accessories, etc.

Phoenix Rubber Co., The, March 11 (Ohio), \$125,000. J. E. Whigam, J. R. Brown, F. Hopper, S. H. Rosh and A. J. Noble.

Ravenna Rubber Co., The, February 2 (Ohio), \$100,000. L. E. Yaggi, H. Hill, W. Ragcliff and H. M. Boyle. To manufacture clothing, etc.

Safety First Auto Parts Co., Inc., March 21 (New York), \$25,000. Paul U. Daniel, George H. Hutchings and Fred S. Jackson—all of 417 Law Exchange Building, Buffalo, New York. Auto parts of all kinds.

Southwestern Tire Manufacturing Co., March 2 (Oklahoma), \$250,000. W. A. McClelland, J. T. Wheatley, John L. McClelland, Charles W. Gunter, C. Charles Jones and W. F. Westcott—all of Oklahoma City, Oklahoma. To manufacture tires and tubes, etc.

Sturdy Tire & Rubber Co., Inc., March 16 (New York), \$1,000. Benjamin J. Laxer, 1537 43rd street; Frank P. Hayes, 373 Tompkins avenue—both in Brooklyn, New York, and Michael Laxer, 338 East 88th street, New York City. To manufacture auto supplies, tires, etc.

Tireoid Co., The, March 14 (Maine), \$1,500,000. T. L. Croteau (president), A. B. Farnham (treasurer) and Albert F. Jones (clerk)—all of Portland, Maine. Office, Portland, Maine. To manufacture and deal in Tireoid and other compounds and compositions for rendering rubber tires puncture proof, etc.

Upright Tire & Rubber Co., Inc., March 1 (New York), \$1,000. Sydney Bernheim, 305 West 72nd street, New York City; Catherine Weldon, 591 7th street, and Harry H. Jacobson, 555 Grand street—both in Brooklyn, New York. To manufacture tires and rubber goods.

Walters Rubber Co. of New York, Inc., March 7 (New York), \$5,000. Howard S. Walters, 182 Miller avenue, Freeport; John H. Jube, 928 East 18th street, Brooklyn—both in New York, and Albert R. Jube, 638 Mount Prospect avenue, Newark, New Jersey. Auto tires, etc.

Unecda Tire Co., March 13 (New Jersey), \$10,000. Nathan Rosenberg, Max Roth—both of 22 Prospect Place, and A. Milton Jacobs, 532 Market street—both in Newark, New Jersey. Office, 9-15 Clinton street, Newark, New Jersey. To manufacture and deal in automobiles, etc.

CLASSIFICATION OF UNCOVERED TENNIS BALLS.

A recent decision of the Board of General Appraisers regarding shipments of uncovered tennis balls by George Borgfeldt & Co., New York City, overruled the collectors' action at New York and Philadelphia in classifying them as "toys," as they were largely used for playing tennis on wet courts and not exclusively for the amusement of children. This decision is of interest to dealers, since under the appraisers' classification as "manufactures of rubber not specially provided for" the duty is reduced from 35 to 10 per cent.

TEXTILE COMMITTEE OF AMERICAN SOCIETY FOR TESTING MATERIALS MEETS.

Committee D-13 of the American Society for Testing Materials held an interesting meeting on Friday and Saturday, March 17 and 18, at the United States Rubber Co.'s building, 1790 Broadway, New York City.

William D. Hartshorne, chairman of the committee, called the meeting to order, and after the routine business had been disposed of, recommendations for standard tests of hose, belting and similar fabrics were discussed.

While substantial progress was made towards unifying the theory and practice of testing the fabrics under consideration, nothing definite was determined. The whole matter will be further considered at the meeting to be held at Atlantic City, New Jersey, next July.

CANADIAN RECLAIMING PLANT BURNED.

The reclaiming works of the Rubber Regenerating Co. of Canada, Limited, Montreal, were almost entirely destroyed by a fire on the 19th of last month from a cause which has not yet been determined. It is stated that there was no inflammable material on the floor where the fire started, nor anything to cause so rapid a progress of the flames as was experienced. Its start was traced at or near the outside window, and there are some suspicions of incendiaryism. The building was a four-story one, the floors being of pine wood, which, with the contents, burned rapidly, leaving the walls almost intact, but the inside practically destroyed. This was a comparatively new department, which was so successful that an extension was contemplated. It is estimated the loss was between \$40,000 and \$50,000. The company has on hand sufficient stock so that no delay is likely to be caused by this conflagration. The shoe factory of the Canadian Consolidated Rubber Co., Limited, was separated only by a heavy party wall, which prevented further spread of the flames. Otherwise the entire block would probably have been destroyed.

A SPECIAL RUBBER NUMBER.

We congratulate our good friend, James Acton, publisher, *The Shoe & Leather Journal*, Montreal, Canada, upon his "Rubber Special," which appeared in March 1. In addition to the regular interesting matter of leather footwear, the department devoted to rubber boot and shoe matters is very complete. It covers the new Canadian list with comments upon them, a review of the Dominion stocks and the prospects for the season. Incidentally, the new rubber price lists are given, in detail, for every type made in Canada, and the rubber news is very comprehensively covered. It will be remembered that early in the spring there is often a banquet of the shoe men in Toronto—this year no exception. In the chronicle of it contained in the "Rubber Special" many old friends among the rubber manufacturers were noted as being present. Among the speakers was R. H. Greene, of Gutta Percha & Rubber, Limited, who reviewed the development of the rubber industry very interestingly.

The cover of the "Special" was graced by a fine portrait of W. H. Miner, of the Miner Rubber Co., Granby, Quebec.

THE ADOPTED LIST OF DRUGGISTS' SUNDRIES.

A TENTATIVE list of soft rubber, druggists' sundries, suggested by the Drug Sundries Division of The Rubber Club of America, Inc., was published in *THE INDIA RUBBER WORLD*, August 1, 1915. With but two exceptions this list has been approved by the United States Customs Service. The revised list is as follows:

SOFT RUBBER DRUGGISTS' SUNDRIES.

Air Beds.	Empyema Tubes.
Air Pillows and Mattresses.	Ether Bags.
Applicators.	Face Masks.
Aprons (Surgeons', Sanitary).	Finger Cots.
Atomizers (Bulb Sets).	Fittings for Nursing Bottles.
Baby Pacifiers.	Funnels (Soft Rubber).
Bags (Breeder, Gonorrhea, Ear,	Gloves (Autopsy, Household, Ob-
Throat, Mastoid, Intra-gastric,	stetrical, Surgeons', Veterinary,
Face, Gas, Sterile Dressing, Ice,	etc.).
Fulitzer, Sponge, Blood-Pressure,	Gum (Bandages).
etc.).	Hospital Blankets.
Bandages.	Ice Helmets.
Basins.	Invalid Cushions.
Bath Sprays.	Medicine Droppers (unless glass
Bed Pans.	chief value).
Belts (Umbilical, Abdominal, Gum,	nasal Feeding Tubes.
Perforated Frictional Belts, etc.).	Nipple Shields.
Bibs.	Nipples.
Bougies.	Obstetrical and Operating Cushions.
Breast Pumps.	Obstetrical Sleeves.
Breast Shields.	Operating Caps and Pads.
Bulbs (Atomizer, Syringe, Complex-	Pessaries.
ion, Breast Pump, etc.).	Rubber Corks and Chemist Stoppers.
Caps (Operating Head Caps, Test	Sheeting.
Tube Caps, Ice Caps, etc.).	Spinal Ice Bags.
Catheters.	Sponges (Rubber).
Coils (Head, Abdominal).	Sprinklers (Disinfecting).
Complexion Caps.	Stethoscope Tubes.
Covers (Drainage, Gauze, Dilator,	Stomper.
Segregator, Sanitary).	Syringes (Bulb and Bag).
Crutch Tips.	Teething Rings.
Cupping Cups.	Tourniquets.
Cushions (Obstetrical, Operating,	Tubes (Rectal, Colon, Stomach, etc.).
Chair, Hospital, Embalming, etc.).	Tubing (Rubber).
Dam (Dental).	Urinals.
Drapers.	Water Bottles.
Dilators.	

RUBBER CLUB STANDING COMMITTEES RECENTLY APPOINTED.

EXECUTIVE COMMITTEE.

Harvey S. Firestone, chairman, Firestone Tire & Rubber Co., Akron, Ohio.

George B. Hodgman, Hodgman Rubber Co., Tuckahoe, New York.

Van H. Cartmell, Kelly-Springfield Tire Co., 227 West 57th street, New York.

H. Stuart Hotchkiss, United States Rubber Co., 1790 Broadway, New York.

William E. Bruyn, L. Littlejohn & Co., 138 Front street, New York.

Paul W. Litchfield, Goodyear Tire & Rubber Co., Akron, Ohio.

LEGISLATIVE COMMITTEE.

Frederick C. Hood, chairman, Hood Rubber Co., East Watertown, Massachusetts.

H. Stuart Hotchkiss, United States Rubber Co., 1790 Broadway, New York.

Jesse E. La Dow, Mansfield Tire and Rubber Co., Mansfield, Ohio.

AUDITING COMMITTEE.

Edward E. Huber, chairman, Eberhard Faber, 37 Greenpoint avenue, Brooklyn, New York.

William G. Grieb, Ajax Rubber Co., Inc., 1796 Broadway, New York.

TIRE SHIPMENTS TO NEUTRAL EUROPEAN COUNTRIES FACILITATED.

The issuance of London permits for the shipment of tires to neutral European countries by the way of England has been greatly facilitated by the adoption of a plan formulated by the advisory committee of the Rubber Club. The British authorities will now recognize shipments certified by the Rubber Club and issue permits promptly. Thus tires can be shipped from England, arriving at their destination before or at the same time as the automobile or motorcycle for which they are intended.

TRADE NOTES.

The Standard Tire & Rubber Co., manufacturers of tires, mill supplies and mechanicals, with offices in the Hippodrome Building, Cleveland, Ohio, and factory at Willoughby, Ohio, has appointed R. F. Valentine, for 12 years sales manager for the Mechanical Rubber Co., Cleveland, Ohio, as director of sales. The newly elected board of directors is as follows: Mark J. Gillen, Christian Narten, D. O. Summers, Robert S. Winsley, E. L. Thompson, John F. Schulte, Charles F. Groth, Charles B. Shaw and R. F. Birch.

The Williams Tire & Rubber Co., McKeesport, Pennsylvania, whose new plant at Lavista, Pennsylvania, is about one-half completed, expects to begin manufacturing by July 1.

The Goodyear Tire & Rubber Co., Akron, Ohio, has enlarged the storage facilities of its branch at Philadelphia, Pennsylvania, by the addition of a new warehouse at 24th and Locust streets, which has a capacity of 25,000 tires. The Philadelphia branch is under the management of Woodson Reese.

The Brooklyn, New York, branch of the Firestone Tire & Rubber Co., Akron, Ohio, whose prospective removal was mentioned in the January issue of THE INDIA RUBBER WORLD, is now occupying its new quarters at the corner of Bedford avenue and Sterling place. The building is of brick, two stories high, and contains 8,000 feet of floor space. E. L. Bixby is manager.

The Empire Rubber & Tire Co., Trenton, New Jersey, is now producing red tires exclusively. Four years ago the company made its first red case and for the past two years the Empire red tire has been featured so successfully that it has now been decided to concentrate on this well-known type.

At the annual meeting of the Kelly-Springfield Tire Co., New York City, held on March 14, at the office of the company at Jersey City, New Jersey, the directors were reelected as follows: Stephen Peabody, Jacob Oppenheim, Arnold L. Scheuer, Gustavus Maas, Austin M. Poole, Otis R. Cook, Frederick A. Seaman, and Van H. Cartmell. Mr. Cartmell is president and Mr. Seaman secretary.

The Luck Tire & Manufacturing Co., which once proposed to build a factory in San Antonio, Texas, has located at Jonesville, Michigan. Special machinery is being installed and the company expects shortly to begin the manufacture of a new tire.

The Federal Rubber Manufacturing Co., Milwaukee, Wisconsin, has discontinued its Denver, Colorado, branch, arranging with the Federal Rubber Tire Works Co. of Denver to act as its distributor for Colorado and adjacent territory. E. R. Cumbe is president of the new distributing concern.

The Marathon Tire & Rubber Co. of New York, Inc., has taken over the business of the Akron-Marathon Rubber Co., Omaha, Nebraska, formerly owned and operated by H. H. Replogle, who remains as manager in charge of this branch, which will handle the business of the company in the Middle West.

The McGraw Tire & Rubber Co., East Palestine, Ohio, has increased its capital stock from \$1,400,000 to \$3,000,000.

The National Tire Service Association, recently organized at Indianapolis, Indiana, will hold its second meeting at Louisville, Kentucky, April 15. The association is composed of tire distributors who endeavor to provide road service for tourists and it is planned to establish tire service stations throughout the United States. The officers of the association are as follows: Roy E. Warner, Louisville, Kentucky, president; Frederick C. D. Dobson, secretary; B. O. Leftwich, treasurer—both of St. Louis, Missouri. Membership committee: Clem T. Strauss, Indianapolis, E. J. Goetze, Kansas City, Missouri, and L. P. Hallaran, Cleveland, Ohio.

The Mason Tire & Rubber Co., Cleveland, Ohio, has increased its capital stock from \$250,000 to \$1,000,000.

The Baltimore Rubber Tire Manufacturing Co. has been organized, and expects to be ready to manufacture tires and inner tubes about July 1. The company has secured a plant at Orangeville, Maryland, which was formerly occupied by the Maryland Mantel & Manufacturing Co. The capital stock of the Baltimore company is placed at \$300,000, all common. George W. Habbersett is president, Harry M. Rever secretary-treasurer, and Albert S. Mauk vice-president and general manager. Mr. Mauk, who will be superintendent of the factory, is a rubber expert, and holds several patents for improvements in tires, which will be exploited by this new corporation.

The Niblette Rubber Co. has secured location at 1777 Broadway, New York City, and will distribute through dealers the "Stronghold" tires and tubes manufactured by the Rubber Products Co., Barborton, Ohio, handling in addition thereto a line of mechanical rubber goods over a large section of eastern territory. H. B. Niblette, the proprietor of this company, was for 17 years associated with The B. F. Goodrich Co., Akron, Ohio, and for the last six years managed the Buffalo branch of that concern, previous to which time he was a salesman connected with the New York branch. He has a large acquaintance in the territory which he will cover in this new connection.

JOHN B. MAUS JOINS FISK RUBBER CO.

John B. Maus, formerly Eastern district manager of the Batavia Rubber Co., Batavia, New York, has joined the Fisk Rubber Co., of New York City, and will have charge of the export department at the general office in Chicopee Falls, Massachusetts. Mr. Maus began his career in the tire industry ten years ago, as special factory representative of the Goodyear Tire & Rubber Co., Akron, Ohio, later coming to New York as district manager for that company. Four years ago he became connected with the United States Tire Co. and remained with that company until he joined the Batavia force in 1914.

FISK RUBBER CO. OPENS NEW WELFARE DEPARTMENT.

Dr. William Hall Coon, whose affiliation with the Fisk Rubber Co., Chicopee Falls, Massachusetts, was mentioned in the December issue of THE INDIA RUBBER WORLD, has recently announced the completion of a plan to center all activities which concern the relation of the Fisk company with its employees under a department of Industrial Relations. The work of this department will be arranged in three main divisions, under the following heads: Division of Safety and Hygiene, Division of Medicine, and Division of Labor.

The Division of Safety and Hygiene will strive to reduce the number of accidents occurring within the plant; to educate the employee in habits of safety and caution, and will take those measures necessary to secure in all parts of the factory the best of working conditions.

The Medical Division will, through a well-equipped hospital and corps of physicians and nurses, care for all those who may become injured or ill during working hours. Visiting nurses will give assistance in the homes to those who may require or wish their services.

The Division of Labor will concern itself with the relations of the company to the individual employee, and through this division an attempt will be made to bring about conditions of labor within the factory which will react with equal benefit to the employee, to the company and to the community.

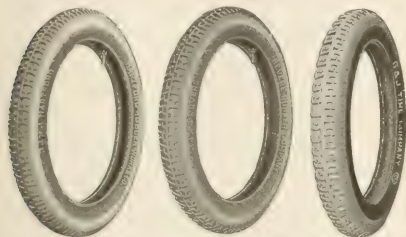
In the furtherance of this plan, and without any cost to the employee, the company has provided for the compensation of all those in its employ who may become ill for any reason or who may be disabled through accidents foreign to their occupation.

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

Progress in the Tire Trade.

THREE NEW INITIALED TREADS.

WHILE it seems almost impossible that any new designs in anti-skids could be produced, three of the big tire companies are out with absolutely new ones. These might be described briefly as initialed tire treads. The Revere Rubber Co., Chelsea, Massachusetts, for example, runs a double row of



R's around the circumference. The Hartford Rubber Works Co., Hartford, Connecticut, does the same with the letter H; while the G. & J. Tire Co., Indianapolis, Indiana, uses the initials of its corporate name in the same way. The effect is very artistic, and, aside from that, there is no doubt that they will provide protection against slipping just as well as any other pattern.

A NEW GUARANTEED TIRE.

The new "Ebony Tread" tire has a ribbed tread of tough black rubber, which commends itself to those who desire some marked individuality and distinction in their outfits.

This tread is the result of exhaustive experimentation, and such thorough and severe tests have been applied to the finished product that the manufacturer places confidence in its endurance to the extent of attaching to every tire a warranty tag, guaranteeing the tread good for 5,000 miles. [The Pennsylvania Rubber Co., Jeannette, Pennsylvania.]



BOWERS BUILDS TIRES.

The Bowers Rubber Works, San Francisco, California, long a manufacturer of mechanical rubber goods, has entered the tire field, bringing out a hand-built tire with a new and effective non-skid tread design. The Bowers company makes a point of the fact that this tire is the result of study and experiment that has gone on for a long time, and feels that it has produced a winner, both in appearance and service.



Headquarters of the Standards Committee of the Society of Automobile Engineers are now in New York City at the offices of the Society in the Engineering Societies Building, instead of in Detroit, Michigan, where a separate office has been maintained for the past year. A. C. Woodbury, recorder of the committee, who has active charge of the routine, has removed his home from Detroit to New York.

THE DOUBLE SEAL TIRE VALVE.

Every one knows that pneumatic tires must be air tight in order to be serviceable. And almost every one knows that a tire cannot be air tight when it is afflicted with a leaky valve.

It is claimed that the double seal tire valve will not leak, which is largely due, no doubt, to the use of rubber washers and packing where leaks are liable to occur.



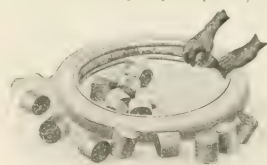
The valve cap, for instance, which is shown above on the right, is provided with a rubber washer. The valve inside, shown under the cap, has a rubber washer just below the head, where it is seated on the end of the valve stem. Also there is a small sleeve packing of rubber near the lower end of the valve that snugly fits the bore of the valve stem. Thus it will be seen by referring to the illustration on the left how effectively the valve is sealed.

These valves are interchangeable with all standard stems. They can be removed and seated without tools, simply by the fingers. They operate so smoothly that the disagreeable labor of pumping up the tire is greatly reduced. [Double Seal Tire Valve Co., New York City.]

A RUBBER TIRE FILLER.

Unlike the various preparations that are pumped into the tire for the purpose of avoiding punctures, this filler is made of rubber. Small pieces are cut up, treated by a special process, and

molded into cylindrical annular forms, which are subsequently vulcanized. These forms are made to fit all the different casings, thereby eliminating the inner tubes. The filler is placed in the casing in sections, after which it is pressed on the wheel-rim by special tools provided for that purpose. Several advantages are thereby claimed—saving inner tube expense, prolonging the life of the casing, and immunity from puncture troubles. [National Rubber Filler Co., Midlothian, Texas.]



IMPROVED TIRE-TESTING TANK.

The tire-testing tank in garages is usually a wooden tub, or barrel sawed in two, partly filled with water, which is generally quite dirty—a condition due to the fact that the water is rarely renewed, as the tub has no drainage connection. A new tire-testing tank made of glazed porcelain has been placed on the market. The white porcelain background reflects the bubbles as they rise from the leak in the inflated tube, and the glazed surface facilitates keeping the tank clean. It stands on a porcelain pedestal, which brings it about 30 inches from the ground, relieving the repair man from the necessity of stooping over while testing a tube. The tank is provided with an outlet that can be connected with sewer or drain. [The Trenton Potteries Co., Trenton, New Jersey.]

CHANGES IN THE FIRESTONE ORGANIZATION.

F. W. Suhr, special factory representative of the Firestone Tire & Rubber Co., Akron, Ohio, for a number of years, has been made manager of the New York tire department.

A. L. Manley, formerly manager of the Buffalo, New York, branch, now manages the Newark, New Jersey, branch, and has charge of the export business of the company handled in Newark.

H. W. McFadden has been transferred from Dallas, Texas, to succeed Mr. Manley as manager of the Buffalo branch.

H. A. Grubb, formerly manager of the Cleveland, Ohio, branch, has been appointed Texas manager, with headquarters at Dallas.

F. M. Moore, who was connected with the office at Chicago, Illinois, has been promoted to managership of the St. Louis, Missouri, branch.

C. W. Sullivan will act as traveling representative, with headquarters at Syracuse, New York.

G. A. Richards, formerly manager of the Columbus, Ohio, branch of the Firestone Tire & Rubber Co., Akron, Ohio, has been made manager of the company's branch at Pittsburgh, Pennsylvania.

G. E. Ranney, formerly of the Chicago, Illinois branch, has been appointed manager in Mr. Richards' place at Columbus.

E. R. Wood, formerly connected with the Los Angeles, California, branch, has been promoted to managership of the branch at Seattle, Washington.

PREST-O-TORCH FOR BRAZING SOLID TIRE WIRES.

It is claimed that the Prest-O-Torch, shown in the illustration, will be the natural successor to the gasoline blow torch and its multifarious uses. This little device consists of a metal nozzle and bent tube, connected by rubber tubing to an ordinary Prest-O-Lite gas cylinder.

It is easy to operate; simply turn on the gas, light it with a match, and an intense flame is produced that can be used for brazing, soldering connections and lead burning in storage batteries. Recently blacksmiths, carriage-makers, buggy repair men and wheel manufacturers have become interested in the use of this torch for brazing the retaining wires of solid tires. For this work a prepared spelter consisting of a brass flux, and brass in granular form is used as a filling material. [The Prest-O-Lite Co., Inc., Indianapolis, Indiana.]



THE DOBBINS REPAIR PATCH.

A new tire repair device consists of four cross chains attached at each end to a metal plate, and an inner patch. When a puncture occurs and the tire is deflated, the patch is placed over the hole, on the inside of the shoe, with the sticky side next the casing. The chains are then placed over the tire, by means of hooks fastened to the rim, between it and the tire bead, the plates to which the chains are attached being slipped over the ends of these hooks. When the tire is inflated the chains hold the edges of the puncture firmly together. This device is made for both straight side and clincher tires, and a curve in the slots in which the chains are inserted in the plates provides for a variety of adjustments. [The Weed Chain Tire Grip Co., Bridgeport, Connecticut.]

CONTINENTAL RUBBER CO. TO BUILD.

The Continental Rubber Co., Sandusky, Ohio, whose incorporation was noted in the March issue of THE INDIA RUBBER WORLD, expects to let the contract for the construction of its factory by May 1. The present offices of the company are in the Laurence building, Sandusky. Directors not mentioned in the incorporation notice are: C. B. DeWitt and W. F. Seitz. J. J. Dauch, president of the company, is an influential man at the head of several other important industries; J. T. Sloat, treasurer, is prominently identified with drydock and shipbuilding interests. Sidney Frohman is vice-president. C. E. Sprague, secretary, and L. J. Weadock, field manager, are under contract to act as sales managers when operations are begun.

PORTER RUBBER CO. BUILDS NEW PLANT.

The Porter Rubber Co., Salem, Ohio, whose incorporation was noted in the November, 1915, issue of THE INDIA RUBBER WORLD, is erecting a new plant which will have a capacity of 400 tires and 400 tubes per day. The factory has about 30,000 feet of floor space and is equipped with a system of traveling cranes for handling material and machinery. The steam plant consists of four 250 horse-power Caldwell water-tube boilers, with Jones under-feed stokers. The power plant consists of an 800 horse-power Harris engine for mill line drive, Erie City variable speed engines for calender drive, and motor drive for the lighter machines. The Banner Machine Co.'s tire building machines with individual motor drive will be used exclusively. Manufacturing will begin by April 1. The officers of the company are as follows: J. C. Porter, president; A. H. Boyd, vice-president; E. E. Boyd treasurer; Grant Hill, secretary and general manager. C. F. Pickton is engineer.

FIRESTONE MANUFACTURES BICYCLE TIRES.

The Firestone Tire & Rubber Co., Akron, Ohio, has recently begun the manufacture of bicycle tires. After months of careful experimenting and testing, two grades of single tube bicycle tires have been brought out by the company, in 28 x 1 1/2-inch size only.

One is a blue tread, white side-wall tire, built with two plies of 9-ounce motorcycle fabric, with an extra strip inserted under the tread. The fabric is frictioned on both sides and skim-coated with pure gum, which it is claimed gives combined lightness, resiliency and strength. The tread is of the well-known Firestone Non-Skid design, and a heavy flannel rim strip prevents creeping on the rim.

The other bicycle tire has a black tread and red side-wall and is made for heavy service, being noticeably oversize. It has two plies of 14-ounce fabric, heavily frictioned on both sides and with an extra skim coat. The tread is of the same Non-Skid design but larger and heavier, and the inner layer of pure extra thick rubber.

MISTAKEN FOR AN OFFICER.

At the recent convention of salesmen of the United States Rubber Co., handsome gold and enamel buttons were distributed bearing the trade mark recently adopted by the company, the letters "U. S." being most conspicuous. This led to a funny mistake recently when a salesman riding on a train and wearing this button conspicuously on the lapel of his coat was asked by the conductor where he expected to find his next victim. Rather resenting a question which seemed to imply a rather uncomplimentary relation between the salesman and his customers, an explanation was demanded, which caused the conductor to more closely examine the button, which resulted in an exclamation: "Aw, shucks! I thought you were a United States post office inspector."

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

ALL branches of the rubber trade in this section report a most prosperous business. In fact, there has hardly been a time since the writer has represented the INDIA RUBBER WORLD in this section that the story has been so universally one of prosperity. The belting manufacturers are benefiting by the scarcity and consequent high cost of leather. Factories which hitherto have used leather belting almost exclusively, are now buying rubber belting as a matter not only of economy but of necessity. This is a season when contracts are usually made for fire department hose, and there is evidence that there is more business in prospect this spring than on any previous one. In the tire business, manufacturers report orders ahead and some of them are increasing their capacity. The footwear trade has been especially favored. Not for years has New England been so thoroughly covered with snow for so long a period, and the consequence has been that trade here in rubber footwear has fully doubled that of any normal season, and every rubber footwear company has been entirely cleaned out of stock goods and has more orders ahead than at any time in its history. The clothing trade has been especially active, and factories making clothing are running along to full capacity. Drug sundries' manufacturers are having their share of the prosperity and, taken altogether, the trade could hardly be in a better condition.

The chief feature of the past month has been the Automobile Show, which this year was a great success, not only as an exhibition, but also as a business bringing project. A record number of machines were sold. The general prosperity of the country seems to be reflected in the demand for new machines, both from veteran motorists and from those who this year are buying their first car. Some considerable trouble was encountered by exhibitors on account of the freight embargo, but, taken as a whole, the exhibition of cars, both for pleasure and business purposes, was far ahead of any previous one. The halls were handsomely decorated, perhaps in a more picturesque manner than at any previous exhibition of any kind given in this great building. The central feature, which would at once attract members of the rubber trade, was a gigantic tire placed in the center of the grand hall, this tire being at the intersection of the center aisles and supported by four mammoth figures, representing Invention, Progress, Industry and Success. Manager Campbell may well be proud of the result of his labors.

Not many tire manufacturers had special exhibits, but the majority of the leaders were represented, their tires being shown upon the machines exhibited. Several companies manufacturing specialties in the accessory business had interesting exhibits. Not many novelties were presented, but many of the booths were very attractive, and the attendants most enterprising in the presentation of the values of their specialties. It would be an injustice to others were I to mention any particular exhibit and, therefore, it may be best to say that, taken altogether, the accessory features of the show were fully as thorough as were the automobile exhibits themselves.

Readers of THE INDIA RUBBER WORLD will recall the fact that a new philanthropy was made possible by the munificence of Thomas Alexander Forsyth and the late John Hamilton Forsyth, of the Boston Belting Co., by the erection of the Forsyth Dental Infirmary in this city. The first annual report of this important institution is at hand and briefly states the object for which the infirmary was founded and the work done during the year 1915. That it must have been and will continue to be a wonderful benefit in its field of usefulness is shown by the fact that an average of 413 patients per day were treated; that the operations amounted to over 130,000, and that these were performed on 19,930 patients. Added

to this there were a large number of clinical cases, while professional lectures to the infirmary staff and free public lectures were given, all on dental subjects. The lectures for the public are held every Sunday. No one can read this concise report without realizing that Mr. Forsyth has set an example of public benevolence which might well be followed by philanthropists in other cities, large and small, in this country.

The United States Rubber Co.'s new premises at 130 Essex street are approaching completion, and undoubtedly the offices will be moved to the new location early this month. This removal, which is simply across the street, will be no inconvenience to the many customers who usually called at the old location, while the change to the more modernized building will be a welcome one to those occupying, and also those visiting, the offices.

* * *

The American Rubber Co. is already settled in its new quarters, and certainly the premises show a splendid adaptation to the needs of that business.

Ellsworth H. Hicks, assistant manager of the clothing department of this company, has recently returned from a very successful trip over a large portion of the United States. Mr.



ELLSWORTH H. HICKS.

Hicks is well known from one end of the country to the other and is one of the leading salesmen in this trade. He has been interested in the waterproof clothing trade his whole business life. Even as a mere lad, so to speak, in 1883, he began his business career with the American Rubber Co., later traveling for the company as far west as the Missouri River, also taking in Canada and the South. He was with that company for 12 years and then went to the Boston Gossamer Rubber Co., representing that concern on the road for four years. For the last 15 years he has been with the Stoughton Rubber Co., occupying most of that time the position of vice-president and assistant manager. Upon the recent consolidation of the Stoughton and American companies he was made assistant manager of the clothing department. Mr. Hicks is a thorough, wide-awake business man who has friends in the trade wherever he has traveled, and that has been far and wide over the United States and Canada, with an occasional trip across the water, and I am pleased to be able to show his face in this connection, knowing that it will be welcome to all those who know him.

* * *

C. J. Bailey, the proprietor of the oldest rubber store in this city, tells me that his is the only surviving one of 24 similar stores which were in existence when he began business or have started since. Mr. Bailey is one of the youngest old men in the business and shows his enterprise by inventing and exploiting some new device in rubber with surprising regularity. H. E. Bailey, his son, is an able assistant in the business and attends to the publicity department, while C. J. Bailey II, now a lusty youngster of four months, is already destined to succeed his grandfather and father as the leading rubber goods retailer in New England.

* * *

The Plymouth Rubber Co. is reported to have increased its sales for January, 1916, 73 per cent over those of January of the previous year, and this increase is the more noteworthy since the business in January, 1915, increased 35 per cent over that of the corresponding month in 1914.

Arthur W. Stedman, the well-known crude rubber man, has just announced to the trade his removal to a new office at 727 Atlantic avenue. This is in the handsome new building at the corner of Beach street, opposite the South Terminal station and within a block of the Hotel Essex, thus being most convenient and accessible to his many patrons and friends in the trade.

A large delegation from the Firestone Tire & Rubber factory was in attendance at the Automobile Show early last month. Among them were: D. S. Swander, district manager; E. S. Babcox, advertising manager; C. H. Sorrick, manager of pneumatic sales, and C. H. Gerhold, manager of accessory sales.

W. H. Piggott has become manager of the local branch of the Federal Rubber Manufacturing Co., at 173 Massachusetts avenue, succeeding Charles Langmaid, resigned. Mr. Piggott is a Milwaukeean, who has been in the Federal factory service for some time.

A new mill is to be erected at Newburyport by the American Tire Fabric Co., which is successor to the American Textile Co. The mill is to be of brick, 186 feet in length, the width varying from 20 to 64 feet. The orders for machinery have already been placed, and it is expected that the mill will be completed within two months.

In my December letter I mentioned the fact that the Bemis Rubber Co.'s plant in Watertown had been sold. I understand that this plant will be equipped to manufacture coffee and breakfast foods from bananas, and also high-grade confectionery, a new company having been formed to exploit this enterprise. Everett C. Tarr, president, and E. Carleton Greenwood, treasurer of the Pan-American Chile Co., are prominent in this new enterprise.

The Meade Rubber Co. is the name of a new concern, which is now building a two-story brick factory at Stoughton, which is expected to be finished and occupied early next month. James Meade, the head of this company, was until recently superintendent of the Plymouth Rubber Co.



JAMES MEADE.

During his years in the rubber business he has invented several improvements in processes for rubberizing fabrics, and it is his purpose to begin the manufacture of hospital sheetings, rubber heels and soles, and some other specialties, such as Gem inner soles for the shoe trade. He has secured a large tract of land close to the New York, New Haven and Hartford railroad tracks, excellently situated for business, and sufficiently large to allow for considerable expansion. The machinery is being installed as fast as the building progresses, and manufacturing will begin almost immediately after the factory is completed. Mr. Meade is a thorough rubber man, having been for over 20 years in the business, going first with the Stoughton Rubber Co. and afterwards with the Mystic Rubber Co., which later became the Plymouth Rubber Co., and from the position of workman in the mill he rose to be superintendent and vice-president of that corporation, a position which he held up to the time when the plant of the Plymouth Rubber Co. was removed to Canton, he deciding to remain in Stoughton and establish a new industry.

David A. Cutler has purchased the business, factory and real estate of the Alfred Hale Rubber Co. in South Boston. The

company will continue to make diving suits, wading pants, rubber cement and molded specialties. Mr. Cutler, who is a recognized progressive, will develop this business along up-to-date lines, and is already erecting new buildings. The company as it stands affords an excellent nucleus as it has always enjoyed a steady, moderate volume of business and high credit. W. D. Lamond, for many years with the Revere Rubber Co., is the superintendent, and Kirk L. Moses, prominently identified with rubber interests, is sales manager. The directors are Edward F. Bragg, Richard C. Storey, Francis H. Swift, Parker G. Stevens and David A. Cutler.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE several rubber factories throughout Rhode Island are at present rushing their plants at the same top-speed that has characterized their activities during the greater portion of the past year, and there is the same insistent demand for additional operatives, both experienced and inexperienced hands, that has been heard for a number of months, notwithstanding that the number of operatives now on the payrolls is far in excess of any previous period in the history of the rubber industry in Rhode Island.

Never in the history of the industry in this State has there been such a continued period of capacity business, and there does not appear to be an immediate prospect of any diminution in the demands upon the resources of the factories. This extraordinary demand is noticeable from both the foreign and domestic sources, and is for goods of all kinds, including the automobile tires, shoes, boots and medical supplies that are turned out at the local plants. The insulated wire business is also very brisk with all producers here.

From all the factories, especially those making rubber shoes, reports are at hand that orders continue to come in, and that every concern has large bookings ahead. These factories are turning out thousands of pairs of rubber shoes every day, in addition to other goods that are being made here, and the result is the greatest output that the industry has ever known in this State. The long, steady spell of bad weather underfoot has greatly accelerated the demand for rubber footwear, and the supply has been very greatly depleted.

The first annual dinner of the Providence factory organization of the Revere Rubber Co. was held at the Crown Hotel on Saturday evening, March 11, and was well attended. The occasion was one of a general "get-together" nature, and called forth a hearty spirit of comradeship and good cheer, which prevailed during the entire evening among the hundred or more employees of the company, who sat down for the first time at their own banquet. Later in the evening they enjoyed a number of addresses and a vaudeville entertainment.

Harlow W. Waite acted as toastmaster at the post-prandial exercises, and introduced as speakers of the evening Dr. T. Whittlesey, director of the New York laboratories of the United States Rubber Co.; Lieutenant James B. Littlefield, Rhode Island coast artillery corps, who spoke on "Our Country's Defenses"; Albert W. Perkins, Superintendent Arthur H. Carr and Foreman W. Ross Gates, the last three being affiliated with the Providence branch. During the serving of the dinner popular selections were played by the orchestra, and many parodies on popular songs pertaining to their own particular business were sung with a zest that left no room for doubt as to their enthusiasm.

Dr. Whittlesey gave an interesting and instructive illustrated lecture on the raising and collection of rubber on the great plantations of South America and Sumatra, referring especially to the 90,000-acre plantation maintained by the United States Rubber Co. on the latter island, half of which is already

yielding raw material. The lecture was illustrated with numerous lantern slides, which showed the young trees from the time they are planted until ready to receive their first "tapping."

He showed and explained the various processes by which the latex, after it is secured from the rubber tree, is cured and made ready to be shipped to the market, and spoke of the practice followed by the United States Rubber Co. in the care of its employees and laborers on the Island of Sumatra. He also spoke at considerable length on the work in the laboratory department, which has by various experiments succeeded in getting the most out of the plantation home products.

Albert W. Perkins gave a short talk on "Employment," and was followed by Arthur H. Carr, superintendent of the plant, who discussed "Production," and W. Ross Gates, a department foreman, who talked on "Safety First" measures. During the brief business meeting which preceded the dinner the following members of the dinner committee were elected: For two years, Frank O. Miles, office manager; Luther T. Benyon, clerk in office, and Albert E. Ludlam, assistant superintendent; for one year, A. N. Smith, William Enright, foreman, and J. Congdon. The committee of arrangements for the first banquet consisted of W. R. Gates, J. T. Brogden, M. L. Coffey, A. N. Smith, H. A. Waite and A. E. Perkins.

Between forty and fifty operatives employed in the new tennis shoe department of the Millville plant of the Woonsocket Rubber Co., which is owned by the United States Rubber Co., became dissatisfied with the piece rate the company was paying in the manufacture of this line of work, and quit work on March 18. They were immediately paid off and discharged, following which the management paid off all the help in the department, which has been in operation only about a month, and the announcement was made that the manufacture of this class of work at Millville would be suspended.

On the day in question some of the help in the new department, who were mostly young men and women, went to the management and demanded five cents a pair for their work instead of 4 cents, the price that they had been receiving. They refused a compromise offer of 4½ cents a pair and a number of them left. The management claims that employees in the new department, who had previously earned about \$9 a week, had been able to earn about \$12 when the trouble came. The people discharged were mostly of Polish extraction. The principal output of the Millville plant is rubber shoes and "lumbermen's."

The National India Rubber Co. is placing a new pressure vulcanizer of the most improved modern type and size in its factory at Bristol. Other vulcanizers of a similar type were placed in the factory a few years ago, and found to be very satisfactory. The brick foundations for the new machine were completed about the middle of the past month, and the work of erecting the machine is being pushed as rapidly as possible, and it will be in operation in a short time. The output of tennis shoes and insulated wire from this plant has increased greatly since the first of the year.

As has already been mentioned, the United States Rubber Co. has resumed manufacturing at the Lycoming rubber mill at Williamsport, Pennsylvania. Thomas S. Walker, for several years prominently identified with the rubber industry in Woonsocket, but more recently at Naugatuck, Connecticut, has been sent to the Williamsport plant, where he will be employed as chief pattern-maker.

Aubrey C. Bartlett has filed notice with the city clerk that he is the owner of the McNaull Tire Co., 50 Franklin street, Providence.

The Fisk Drug Co., which opened a new store at Weybosset and Union streets, Providence, the first of last month, will specialize on Davol rubber goods.

THE RUBBER TRADE IN AKRON

By Our Regular Correspondent.

WHAT was almost a local holiday for the entire city was the gathering of the salesmen at the B. F. Goodrich Co. convention on the second and third of last month. The selling forces of this company in all parts of the country, with the exception of the Pacific Coast, were brought to Akron, as much for the purpose of engendering good fellowship and loyalty to the company as for instruction. The affair was a wonderful success from beginning to end, every participant showing enthusiasm during the two days of the convention and departing with an even higher estimation of the company which they represented.

Four special trains of Pullman cars brought the visitors to this city in the early morning when they were greeted by the committee chosen for that purpose, and taken in auto-



AUTOMOBILE PROCESSION OF GOODRICH SALESMEN.

mobiles on a trip through the principal streets of the city, where many citizens had decorated their stores or residences with bunting and flags as a welcome to the visitors. Of course the Goodrich plant was quite elaborately decorated, as was also the convention hall, in each case the general scheme being green and white, with a large amount of imitation rubber leaves, while the entire route from depot to factory was marked with Goodrich sign-posts. After the parade the salesmen were taken to the Portage and Howe hotels, which had been specially ornamented for the occasion, the entrances and lobbies of each being transformed by decorations of rubber leaves covering the walls and ceilings giving them a semblance of an Amazon rubber forest. The decorations of the hotels and factory were designed by F. C. Inglehart, of the advertising department. Some of the delegations carried appropriate pennants or banners, while others wore distinguishing costumes, a peculiarly appropriate example being the Quaker hats of the salesmen from Philadelphia; and many amusing banners served to show in a humorous way the homes of several of the delegations.

The conference was held at the plant of the Goodrich company. The Thursday morning session was opened by W. O. Rutherford, whose recent appointment as sales manager of the company made him the subject of many congratulations. In his opening address he stated that this was not to be considered as simply a business convention, but rather a returning home of the members of one big family; for, as he said, in no other way could an appreciation of the good fellowship existing and the growth of the institution and the modernizing of manufacturing methods be realized.

The afternoon session was devoted to a trip through the factory, and here the salesmen were shown not only in a general way the magnitude of the works, but each group was specially shown the manufacture of the lines of goods which they sold.

On Friday short talks were given by the various department managers. "Advertising" was discussed by E. C. Tibbits. J. C. Lawrence spoke on "Credits." Dr. W. C. Geer, head of the developing department, explained briefly how crude rubber is successfully compounded and adapted to the many commercial uses to which it is put today. His talk was fully illustrated by lantern slides.

In connection with this convention a special edition of "The Goodrich," the house organ of the company, was printed and this is one of the handsomest specimens of such trade publications which we have seen. It consists of 40 pages, with a colored cover showing a bird's-eye view of the 57 buildings comprising the Goodrich group in connection with a giant figure typifying the Goodrich institution. He is represented as studying the world, its wants and its needs—a very striking idea, well carried out. The pages, of course, have much to say regarding the company, its management and its goods, and every page is appropriately and some are profusely illustrated. The most striking of these are the two middle pages, which when unfolded occupy a space nearly a yard long and contain individual portraits of all the members of the sales organization of the company. The department directors' and branch managers' pictures are shown grouped around that of General Sales Manager Rutherford, while the rest of the space contains small but effective portraits of 620 salesmen from the different branches, these being all numbered and tabulated, thus enabling the face of any one of this big sales force to be found at once. There are quite a number of amusing cartoons, each characteristic of the person so represented, and some other features which make the magazine more than usually interesting to its many readers.

The Portage Rubber Co., at Barberton, has just completed an addition to its plant and is now erecting another, 61x100 feet and three stories high, to be used for manufacturing tires. These additions increase the output of the Portage plant by 50 per cent.

The Service department of the Firestone Tire & Rubber Co., which is under the management of L. Greenwald, held its fourth annual conference March 16 to 18. From all over the United States the men gathered together at the home plant to review the work of the past year and discuss the problems connected with tire usage. "Courtesy, Friendliness and Fair Dealing to Each Customer Spells Real Service" is the slogan of these Firestone service men, and motorists throughout the country will share in the benefit of improved methods of service and increased effort engendered by this meeting.



L. GREENWALD

The women employees who have worked for the Firestone company three years are rewarded if they leave to be married by two weeks' vacation with full pay and two weeks' additional salary.

Early last month district sales managers of the Goodyear Tire & Rubber Co. met at the home offices to review past development and plan for the future. The reports of these managers showed a remarkable growth in the sales and popularity of the Goodyear tires.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

JOHN A. LAMBERT, of the Acme Rubber Manufacturing Co., is the head of the Manufacturers' Committee named to cooperate with a committee of the Trenton Chamber of Commerce to arrange for a big industrial show in the Second Regiment Armory sometime next fall. The unusual success attending the recent automobile show held in the armory has inspired a movement to hold the industrial show.

Those who financed the automobile show went into the project with the idea that they would be satisfied if they got back their original investment. The event was so successful, however, that the executive committee declared a dividend of 50 per cent. Many of the rubber companies have already made tentative plans to take part in the proposed industrial show and there is every reason to believe that it will prove even more of a success than the automobile show.

One of the features of the automobile show was an exhibit of tires made by the Thermoid Rubber Co., and which were used by Resta, De Palma, Burman and other "speed kings" in some of the recent auto classics. In spite of the crucial tests to which they had been subjected the tires were all intact.

* * *

The Globe Rubber Tire Manufacturing Co. had an interesting exhibit of its tires and tubes at the auto show. This concern's display occupied two booths and thousands of people were attracted by it.

The Essex Rubber Co. exhibited at the show and featured some of the newer products it has added to its already extensive line.

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Workmen from the various tire manufacturing factories in Trenton have formed an organization. One of the objects of the organization, the men say, is to promote cooperation between the employees and the heads of plants.

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Trenton rubber manufacturers are in some instances considerably embarrassed by the long-continued strike of the workmen in the local foundries. It has been difficult for some time to obtain molds. Five foundries are affected by the strike.

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John A. Lambert, of the Acme Rubber Manufacturing Co., as chairman of the Manufacturers' Committee of the Chamber of Commerce, has taken up with the Inter-State Commerce Commission the question of the embargo on freight transportation, as it at present exists along the Atlantic coast, from Baltimore to Boston. The railroads are handling practically no shipments from factories between New York and Philadelphia and the situation is becoming intolerable. It is thought the Inter State Commerce Commission may be able to obtain some relief for the manufacturers.

The Philadelphia and Reading company lifted the embargo in Trenton for a time this week and as soon as this news was noised about the local station was swamped with shipments.

WESTERN NOTES.

Katzenbach & Bullock Co., of New York, Trenton and Chicago, announce the opening of an office in San Francisco, California, in conjunction with the L. H. Butcher Co., to care for largely increased business in the West.

W. D. Albright has been appointed manager of the Seattle, Washington, branch of The B. F. Goodrich Rubber Co., Akron, Ohio, with supervision of the firm's interests in Portland, Spokane and Vancouver, B. C. He succeeds W. S. Bloomer, who has been advanced to the position of special mining representative for the Goodrich company.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

NEXT to the war, with its various fortunes, the main topic of late has been the weather. The heavy rainfall of the earlier part of February was followed in the last week of the month and the first week of March by a series of snowstorms of unusual severity. There has been a great run on goloshes and snow boots, and the dealers must have ended the season well. I myself have invested for the first time in a pair of Boston storm slippers, and am very well satisfied with my purchase. These are retailed by the boot shops at 5s. per pair, against 3s. 9d. a pair for home-made goloshes, and I am told that they are becoming very popular. Owing to scarcity of labor, it has not been possible to clear the streets of snow with anything like the accustomed celerity, and this has made the wearing of goloshes more of a necessity; and again there is the fact that, while the price of leather boots has advanced, their wet-resisting properties have not improved, but, if anything, have shown a retrogression. All the circumstances, therefore, have been in favor of better rubber footwear trade.

ALL MANUFACTURING LINES ACTIVE.

With regard to business there is little of novelty to report. One cannot find a manufacturer who confesses to being slack, not even in the rubber heel trade, which is not supported by government orders as are the great bulk of the rubber manufacturers. A considerable amount of proofing for various classes of goods is still being done on government contracts, and the factories have very little opportunity to work for the home and export trade, although plenty of business is to be had owing to the depletion of warehouse stocks held by dealers and shippers. The labor question is becoming increasingly acute, owing to the demand for men by the military authorities, and the imminent severe revision of those engaged in "starred" trades will inevitably tend to further difficulties. Several important rubber works are now controlled by the ministry of munitions, and as there seems to be some misunderstanding as to the meaning of this, I may say that the control extends only to the particular article or articles which the firm is turning out for this ministry. Regarding the rest of the firm's business, whether it is concerned with other government departments or with private trade, the management remains, as before, entirely in the hands of the firm's officials, with no more supervision than is customary in the care of government contracts, and which is referred to in the specifications.

FOREIGN BUSINESSES CLOSED DOWN.

The fact that orders have been issued for the closing down of various British houses of enemy origin will remove a good deal of competition from the path of neutral and allied firms now trading in Great Britain. Four prominent firms to be wound up are the Calmon Asbestos & Rubber Works, Limited; the Peter Union Tire Co., Limited; the Harburg-Vienna Rubber Co., Limited, and the Rhenish Rubber & Celluloid Co., Limited. As I am confining my pen to the bare retailing of news I do not propose to make any comments on the personalities, whether of British or Teutonic origin, who have been so long known to many of us in their conduct of these businesses.

TRADE AFTER THE WAR.

A good many meetings have been held in the country to discuss the important question of trade after the war, and, although party politics are supposed to be defunct for the time being, or at any rate moribund, the main controversy underlying all the discussion is the old political one of free trade versus protection, a matter in which neutrals, allies and enemies are all

concerned. An important matter has been the defeat of the free trade directors of the Manchester chamber of commerce on a no change policy in the cotton trade. The majority of the members who brought about this defeat, which caused the resignation of most of the directors, belong to a great variety of trades, and cotton is poorly represented in the 29 nominations for the new board of 22 directors. Among these nominations is P. A. Birley, of Charles Macintosh & Co., and a director of the North Borneo Rubber Co., and Marshall Stevens, a director of the Xylos Rubber Co., Limited, though better known in America as the chairman and managing director of the Trafford Park estates. It may be taken that the great majority of the new board will be strong advocates of protective duties in manufactured goods, and development of interest may now be expected.

NORTH BRITISH RUBBER CO., LIMITED.

The new chemical research laboratory being erected by this concern is a model one. The room is very lofty, and is lighted by windows on three sides. The benches are designed to accommodate four research workers each. Artificial illumination on the "eye-rest" indirect system has been specially arranged to avoid shadows and glare. A few direct lighting units, installed for special purposes, are shaded to avoid any naked light sources in the line of vision. An electric blower has been installed for ventilation purposes. Steam, gas and electric power are supplied to the extraction bench, and high pressure water from the mains is supplemented as a precaution by a low pressure supply from a storage tank in the roof. Special attention is being devoted in the balance room to obviating the effect of vibration from the factory.

RUBBER BELTING.

At a meeting of the Manchester Association of Engineers held on March 4 a paper on "Rubber Belting" was read by Mr. James Tinto, of the Irwell & Eastern Rubber Co. The history of the rubber belt in England and America was given, and special mention was made of the large conveyor belts, which, originating in America, are being made by his firm and others on a scale quite equal to the mammoth products of America.

THE INDIA RUBBER MANUFACTURERS' ASSOCIATION.

J. T. Goudie, of the Leyland & Birmingham Rubber Co., Limited, occupied the chair at the annual meeting held in Manchester on February 22. There was a good attendance, and the various matters dealt with in the chairman's speech showed that the work of the past year had been largely concerned with matters which had arisen through the war, and were of great importance to the trade generally. The matter of import duties on foreign-made goods has been under discussion during the year, but beyond saying that complete harmony does not reign in the committee on this point I shall not enlarge on the topic. It is generally acknowledged that Mr. Goudie has made an excellent chairman, bringing wide business knowledge and considerable energy to his duties, which have been by no means light, and it is not surprising to find that he has been re-elected chairman for the current year. Peter Bate, manager of the Castle Rubber Co., Warrington, was re-elected vice-chairman, the following being elected to the committee: P. A. Birley, (Charles Macintosh & Co.); I. H. C. Brooking (St. Helens Cable & Rubber Co.); R. Eccles (F. Reddaway & Co.); Viscount Grimston (Grimston Tires); W. M. Henderson (Ancoats Vale Rubber Co.); F. Webster (Avon India Rubber Co.); David Moseley

(David Moseley & Sons), and J. Tinto (Irwell & Eastern Rubber Co.). Mr. Eccles continues to act as treasurer, and Reginald Moseley and James Henderson are the auditors unprofessional. No new firms are represented on the committee, which indicates that the abstention of several important rubber works in London and Scotland still continues.

BOOTS FOR THE BOYS IN THE TRENCHES.

Malcolm C. Cumming, the well known planter and chairman of the Planters' Association of Malaya, who some time ago started a scheme to purchase knee rubber boots for the British troops in the trenches, at a recent meeting of the Rubber Growers' Association, of the council of which he is a member, secured the support of that organization, which voted £150 [\$730] towards his fund, while individual members present at the meeting subscribed a further £800 [\$3,892], and the sum has been considerably increased since then. Mr. Cumming has also circularized rubber companies for help in cash and in rubber scrap. If the latter is donated a manufacturer has agreed to purchase it all at market prices, and furnish boots to its value at about 10s. [\$2.40] a pair. The retail price of this class of boots here is now 22s. 6d. [\$5.40] a pair. In case funds continue to be received Mr. Cumming will make trips to the continent to see that the boots reach the units for which they are intended.

RUBBER GROWERS' ASSOCIATION.

Apocryphal of the Rubber Growers' Association, the general meeting, which was held February 18, was a most interesting one. E. L. Hamilton, chairman of the association, presided, and in an extended address gave a complete review of the work of the association and its various committees during the year, covering among other points the reorganization, in which he spoke of the great value of the research work, commending the formation of local committees in Ceylon, Malaya and Southern India. He criticized the excess profits duty which has been levied by the government and which in the opinion of various members worked a hardship upon those companies in the intermediate stage of development. He told of the opening of a new fund for rendering assistance to those who have gone from British Malaya to take part in the war. Up to the time of the meeting, £12,000 had been donated or promised, and nearly 1,000 men have left Malaya to join His Majesty's forces, of whom over 600 are planters, while Ceylon has provided at least an equal number of men.

He highly praised the work of Malcolm Cumming, mentioned above, and gave some very interesting statistics of plantation rubber. He told of the demands for rubber created by the war, and called attention to the endeavors to induce the war office to experiment with rubber for tires on artillery and supply wagons, and as armor for vessels.

The chairman called attention to the devices resorted to by Germany to obtain rubber, and gave some interesting statistics of the plantation industry which are quoted here:

It is estimated that about 70 millions sterling of British capital is invested in the plantation industry, this figure representing the issued share and debenture capital, with the premium on shares and reserves put back into the estates.

The total area under rubber is approximately 1½ million acres, Malaya leading with 670,000 acres; Ceylon 224,000 acres; the Netherlands Indies 517,000 acres; Southern India and other countries 90 to 100,000 acres. Approximately 80 per cent of the total is British.

The world's production of rubber for 1915 is estimated at 146,000 tons, of which 98,000 tons are plantation; and for this year the estimated production of plantation rubber is between 130,000 and 135,000 tons, thus showing the remarkable development of the industry. For 1914 the production was but 71,380 tons and for 1910, 8,200; while in 1905 there were only 145 tons produced on plantations.

According to the Board of Trade figures, Great Britain retained 15,000 tons for home use against 18,500 for 1914. Russia's demand

was 16,000 tons for 1915 against 11,000 tons in the previous year, while France increased her consumption over 1914 by 2,000 tons. All these figures are approximate.

Shipments from Malaya to America increased from 5,700 tons in 1914 to 23,000 tons in 1915. With regard to Ceylon, there were 4,096 tons shipped direct to America as against 8,209 tons in 1915.

After speaking of the great prosperity of the rubber industry in America and estimating that the United States would need 75,000 tons for the manufacture of automobile tires alone, he concluded as follows:

As to the future of the rubber industry, I am afraid I must be excused from prophesying. This industry takes a high place in the world's commerce, and we must aim at making the plantation industry take the premier position. Cooperation is necessary to achieve success, and so long as we keep together and work with the ultimate object of benefiting the industry, that success is assured. We have common interests at stake, and our Association has been of infinite service in bringing us together to discuss many matters of policy and principle.

The industry is still, comparatively speaking, a young one, and therefore there is much for us to do. There is one thing to be said, I do not think we could have kept pace with the rapid strides made during the past years unless we had had the Rubber Growers' Association to represent the plantation industry.

The election resulted as follows: Charles Emerson, chairman; Sir Edward Rosling, vice-chairman; ordinary members of council, W. Arthur Addisell, James F. Anderson, Sir John Anderson, F. W. Barker, Noel Bingley, Frank Copeman, E. L. Hamilton, T. G. Hayes, Captain W. R. Hoare, Arthur Lampard, John McEwan, Lieutenant R. K. Mayor, W. P. Metcalfe, H. K. Rutherford, G. A. Talbot, Noel Trotter; P. R. Rutherford, Auditor.

TRADE-MARK DECISION.

An interesting question regarding the use as trade-marks of names spelt backwards is brought up in the case of the "Gnidroc" trade-mark. J. C. Cording, Limited, and George Cording, Limited, are two firms, each making and selling waterproofs. J. C. Cording, as the older firm, objected to the registration by the George Cording firm of the word "Gnidroc" (Cording spelt backwards) as a trade-mark for rubber goods. Justice Neville in the lower court held, with the registrar, that the mark was an invented word, and therefore capable of registration. The Court of Appeals has recently reversed this decision, concluding that the use of the word "Gnidroc" was intended to secure the advantage of the word "Cording," and therefore calculated to deceive.

THE LATE J. E. BAXTER.

It is with great regret that I have to record the death of J. E. Baxter, principal of the firm of J. E. Baxter Co., Limited. Mr. Baxter was a well known personality in the trade, having been connected with the rubber industry during his whole business life. Some years ago he made a most strenuous trip to South Africa, and it seemed to me and to others that his health was somewhat seriously affected, and that he never really recovered the good health he enjoyed previous to that time. He was one of the first of our manufacturers to take a practical interest in rubber planting, and I remember, many years ago, being told by a mining engineer in London that he had been at a rubber plantation meeting in the city, when a man named Baxter got up in the hall and spoke about rubber in such an authoritative way that it made the remarks of the chairman and other speakers seem rather poor in comparison. Mr. Baxter was of a genial disposition, and will be much missed by a wide circle of friends.

George A. Morton, formerly assistant works manager of Pirelli & Co.'s cable works at Southampton, England, has resigned and accepted a similar position with the Dunlop Rubber Co., Limited, at its Birmingham factory.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

THE RUBBER TRADE IN GERMANY.

By Our Regular Correspondent.

CONDITIONS here have not improved since my last writing. We are still isolated from those parts of the world which could furnish us the raw materials we need, and we all know that this state of affairs will continue until victory is won by our brave troops. In the meantime we continue to do as best we can with substitutes for all those materials which are no longer to be had. We have sufficient crude rubber for our military requirements, but none is available for other purposes. This situation is very difficult for those of our manufacturers who have not the good fortune to have orders for the army or for the navy.

WAR RUBBER QUALITIES.

I have already written much regarding war quality rubber goods, which are made wholly or largely of substitutes for crude rubber.

It cannot be denied that our rubber manufacturers have done wonders, and we can rely upon their doing better still. Our rubber industry has prevented the wheels of our other industries coming to a full stop, and at the same time it has kept our army and navy adequately supplied with the rubber goods they require in enormous quantities.

Prior to the war, crude rubber prices were so low that our manufacturers used less and less reclaimed rubber. Bitter necessity has obliged them to reverse this policy, and they are now using reclaimed rubber and substitute with the same skill that previously characterized their handling of crude rubber. Of course the substitute quality goods are not as good as standard qualities but, nevertheless, they answer their purpose. The regrettable feature of it all is that consumers generally fail to comprehend that present prices have little relation to quality. They are too ready to believe that war quality goods, because higher priced, should be at least as good as before-the-war standard qualities. The increasing demand for reclaimed rubber has naturally caused the prices to advance until now it costs much more than did crude rubber prior to the war. Of course goods made of such material are far less durable, and manufacturers cannot be blamed if the war qualities do not give the service that was obtained from normal products.

In this connection our rubber manufacturers should be grateful to your German contemporary, the "Gummi-Zeitung," for its incessant efforts to instruct dealers and consumers as to what they reasonably can expect from the goods the manufacturers have so much difficulty in producing.

War qualities vary considerably, their durability being naturally affected by the origin of the substitute used in manufacturing them. The variations in the quality of reclaimed rubber make it impossible for manufacturers to work on established formulas. The manufacturer has to take what he can get, and the reclaimer is not always able to obtain the chemicals he would prefer in order to turn out the best possible product.

CEMENT DIFFICULTIES.

One of the most difficult problems our manufacturers had to solve was the making of rubber cements from reclaimed rubber, especially those to be used in the manufacture of such articles as inner tubes for pneumatic tires, for which purpose the cements made from the best crude rubber are used in normal times.

POSSIBLE EFFECTS OF WAR QUALITIES.

Our rubber manufacturers and dealers in rubber goods are much concerned regarding the effect war quality goods may have upon the future of their business. Our rubber industry has proved that it is independent of foreign countries, and can do wonders even without importing crude rubber. As war qualities do not materially differ in appearance from standard qualities, there is much conjecture among dealers and consumers as to qualities after the end of the war. It is feared that manu-

facturers will continue to produce substitute goods along with regular qualities, and thus bring all qualities into disrepute. There is really no basis for this fear, for all our factories will return to crude rubber as soon as it is available at reasonable prices because of the fact that it is far more simple and less expensive to use crude rubber than it is to work as they are now doing with its substitutes.

TAXES AND WAR LOANS.

The authorization of war loans by the Imperial Parliament is generally considered as a matter of course, but it is not quite so with the imposition of new taxes, which will be necessary to cover these loans. Here opposition is evident, and to avoid it the proposed "Excess Profit Tax," which, though it will not directly affect the masses of the people, is of much concern to our leading industries. This proposed "Excess Profit Tax" is very likely to become a law, and it is to be expected that it will prove especially severe upon our rubber manufacturing companies who have been put to great expense by the war, and who have already contributed their share to the defense of the fatherland by generously subscribing to the several war loans. Our rubber manufacturers are receiving high prices for their products, but it must not be forgotten that much has been expended for special machinery for handling war orders, and for experiments with substitutes, while the cost of both materials and labor is infinitely higher than in normal times.

CUSTOMS UNION.

A subject which is attracting much attention here is the agitation in favor of a customs union or "zollverein" between the Central European powers. Generally speaking such a proposition has always been favorably considered by German interests, whereas, in Austria-Hungary, many leading people were bitterly opposed to any closer economic union with Germany than existed before the war. In October last, however, the Vienna chamber of commerce adopted a definite policy in this connection, and gave the first official outlines of the proposition, at the same time bringing forward specific demands, and establishing a basis for negotiations, which have been making good headway and regarding which I hope to be able to write more at length in my next communication.

TRADE NOTES.

The Globus Gummi und Asbestwerke, G. m. b. H., Ahrensbock, near Lübeck, manufacturer of rubber and asbestos goods, has increased its capital from 200,000 marks [\$47,600] to 780,000 marks [\$185,640].

The Gummiwerke Max Bühling, G. m. b. H., was recently incorporated at Eschweiler, near Aix-la-Chapelle, with a capital stock of 60,000 marks [\$14,280], to purchase and sell crude rubber, gutta percha and similar materials, also to reclaim scrap rubber, and to manufacture and sell rubber goods.

The Norddeutsche Gummi und Asbestmanufaktur Müller & Eggeling, Hanover, has been dissolved, and Gustav Eggeling, of the firm, has been made liquidator.

Karl Flothow has retired from the board of directors of the B. Pollack Co., Walterhausen, and the vacancy thus created has been filled by the election of Paul Strobel.

AUSTRIA-HUNGARY.

The Kaiser Franz Josef's Akademie der Wissenschaften (Kaiser Francis-Joseph's Academy of Sciences), Prague, Bohemia, has offered a prize of 5,000 crowns [\$1,015] for the best work on a substitute for rubber automobile tires.

DUTCH EMBARGO ON RUBBER EXPORTS.

The Netherlands Government has placed an embargo on all exports of rubber and gutta percha and goods made of or containing these materials.

EUROPEAN TRADE NOTES

SWITZERLAND.

GOTTLOB KELLER has formed a company for the wholesale distribution of rubber mechanical and surgical goods at Biel, in the Canton of Berne.

FINLAND.

A special meeting of shareholders was recently held in Helsingfors by the Suomen Gummitehdas Osakeyhtiö, manufacturers of rubber footwear and general rubber goods. This company's paid-in capital now amounts to 908,200 Finnish marks [\$174,283].

NORWAY.

The great fire which on January 15, last, devastated a large section of the city of Bergen destroyed the premises of the firm of Klaus Reimer, 7 Olaf Kyrrsgate, wholesale and retail dealers in packings and rubber mechanical goods.

SWEDEN.

The Svenska Gummifabriksaktiebolag, Gislaved, has resumed its manufacturing operations which for some time were suspended on account of the lack of crude rubber.

The Ryska Gummifabriksaktiebolag, Malmö, which had suspended its manufacturing of rubber footwear for the same reason, has also been able to resume operations.

Gustaf Janson has been made managing director of the firm of F. Reddaway & Co., Stockholm, wholesale dealers in belting and rubber mechanical goods.

The Skandinaviska Gummiaktiebolag, Viskafors, whose rubber footwear manufacturing department was burned in the latter part of 1915, has purchased the machinery and rented an abandoned footwear factory in Lidköping, and will resume the manufacture of rubber footwear.

Aktiebolaget Stockholms Gummifabrik is the name of a 200,000 crowns (\$53,600) corporation recently organized in Stockholm to manufacture rubber goods.

HOLLAND.

Wiese & Co., importers of crude rubber and gutta percha at Rotterdam and Amsterdam, Holland, call our attention to recent changes in that firm. M. J. Overeinder, who had for many years power of attorney for the firm, has been admitted to the partnership, and F. A. F. De Gruyter has been granted power of attorney at the Amsterdam branch of the concern.

RUSSIA.

The Russian correspondent of THE INDIA RUBBER WORLD, in a letter published in the March, 1916, issue of this paper, stated that the Russian-French India Rubber, Gutta-Percha and Telegraph Works "Prowodnik," formerly of Riga, now in Moscow, had materially increased its capital. Subsequent information shows that this increase amounts to 5,000,000 rubles (\$2,575,000), the company's capital now being 23,000,000 rubles (\$11,844,000), instead of 18,000,000 rubles (\$9,270,000).

JAPAN'S COMMERCE IN CRUDE RUBBER AND RUBBER GOODS.

By Our Regular Correspondent.

THE official statistics of Japan's commerce in crude rubber and manufactured rubber goods shows a very gratifying increase over that of 1914. The volume of crude rubber imported amounted to nearly 4,000,000 pounds, as compared with less than 1,000,600 pounds the previous year, while in value the increase amounted to \$708,479. The official figures of the imports from their sources, as compared with those of 1914, are as follows:

From—	1914.		1915.	
	Pounds.	Value.	Pounds.	Value.
British India	800,076	\$223,637	1,114,441	\$470,329
Straits Settlements	1,646,556	678,730	2,017,176	863,593
Dutch India	13,034	1,578	299,774	113,083
Great Britain	224,500	159,312	352,164	156,863
United States	11,914	8,166	98,430	58,819
Other countries	2,582	1,786	21,565	13,109
Total	2,305,262	\$1,073,319	3,903,550	\$1,715,798

The first of the year importations were small on account of the embargo placed by the British government on all crude rubber exports from the British colonies. But this embargo was raised early in March, when an agreement was made with the Japanese government whereby it ruled that no crude rubber nor manufactured rubber goods should be exported from Japan to any country without the sanction of the British authorities. The result was that crude rubber was directly imported in April from the Straits Settlements and British India into Japan.

The main reason for the increased demand for crude rubber was due to the heavy exports of Japanese rubber goods to Russia, China, Great Britain and other countries, as well as to supply the deficiency at home because of the falling off of imports of rubber goods of foreign manufacture. The official figures of the imports of rubber goods show this decline of imports in many of the items of the following table:

IMPORTS OF RUBBER GOODS INTO JAPAN.

	1914.		1915.	
	Pounds.	Value.	Pounds.	Value.
Reclaimed and unvulcanized rubber	285,269	\$43,368	168,060	\$26,822
Dental rubber	20,464	39,142	15,527	29,003
Soft—				
Rods and cords	105,193	44,264	55,910	22,941
Plates and sheets	88,856	25,195	72,641	18,656
Tubes	73,460	30,525	49,004	15,120
Belts and beltings for machinery	39,432	17,677	28,490	10,356
Threads, strips, bands, rings and washers	57,473	52,924	36,878	45,660
Other soft goods	30,105	21,774	5,878	4,386
Hard—				
Lumps, bars or rods, plates and sheets	36,395	23,544	7,777	7,868
Other hard goods	15,080	10,541	11,304	2,512
Bicycle tires	182,226	215,950	37,348	40,735
Insulated electric wires:				
Armored with metals—submarine, telegraphic and telephonic cables		463,245		154,637
Other armored cables	1,760,118	187,113	531,390	53,956
Flexible cables	14,330	4,730		31
Other cords	99,969	29,998	4,693	2,440
Rubber boots (pairs)	5,699	9,576	4,434	7,270
Overboots (pairs)	25,343	12,488	21,500	11,454
Beltings and hose	389,370	183,625	173,984	94,984
Waterproof tissue	19,874	14,933	24,740	16,637
Elastic webbing, cords and braids		32,178		26,592
Insulating tapes	56,532	21,267	48,118	18,524
Total		\$1,489,057		\$610,584

In addition to the above imports of foreign goods into Japan, automobiles and parts (including tires) were imported to the value of \$82,633 in 1915, against \$249,211 in 1914, and bicycles and parts (exclusive of tires) to the value of \$156,501 in 1915, against \$517,548 in 1914.

It will thus be seen that the imports of rubber goods decreased 59 per cent from those of 1914, and about 77 per cent from 1913 figures. This decrease is a source of congratulation to Japanese manufacturers owing to their greatly enlarged trade, showing that they are now producing rubber goods recognized by the people of this country as equal to those of foreign make, or nearly so, the exception being some special goods on which, however, it is hoped they will be enabled to improve their production so as to almost entirely replace those of foreign manufacture. It is a notable fact that as soon as the embargo was raised against exporting Japanese manufactured goods to any country at war with Great Britain, Japanese manufacturers took advantage of the opportunity to fill orders which they already had on hand for export, and immediately started to give a wider scope to their foreign trade in China and other parts of Asia, Russia, and also to Australia, England and the United States.

Figures showing exports of goods manufactured of rubber, as given in the official report include:

	1914.		1915.	
	Pounds.	Value.	Pounds.	Value.
Insulated electric wires and bicycles	103,000	\$260,028	1,200,000	\$388,076
.....		\$43,135	2,512,969	1,706,315
Total		\$740,063		\$2,156,091

Other export figures include waterproof cloth for surgical use in the Russian army, to the value of \$50,000; various soft rubber articles for British India, to the value of \$15,000; dolls, balls, balloons, toys, etc., to the United States and other countries, to the value of \$100,000, and similar articles to Russia, to the amount of \$50,000; the aggregate total value of these and other goods wholly or partly of rubber amounting to over \$210,000.

The prices of Pale sheet plantation rubber varied considerably during the year, as will be seen by the following table:

PLANTATION RUBBER.

	Prices per pound.		Equivalent in cents.		Prices per pound.		Equivalent in cents.
	Yen.	Sen.			Yen.	Sen.	
January 20.....	1	10	55	July 21.....	1	26	63
February 27.....	1	21	61	August 26.....	1	30	60
March.....	1	22	62	September 27.....	1	16	58
April 27.....	1	20	60	October 20.....	1	24	62
May 21.....	0	20	60	November 26.....	1	50	75
June 22.....	1	23	63	December 16.....	1	58	79

MANUFACTURING SITUATION IN 1915.

Naturally, manufacturers were greatly hindered the first of the year by the shortage of crude rubber, but after the first of April imports were sufficient to enable them to run their factories to full capacity. Tire manufacturers benefited by the shortage of European goods, owing to the seizure of factories for uses of the armies. Some of the hard rubber manufacturers received orders for several thousand gross of poker chips and similar articles from Russia, and manufacturers of nursing nipples were enabled to export some 30,000 gross to British India. The United States sent orders for several hundred thousand gross of toy balloons, and Russia gave orders for waterproofed fabrics which required the consumption of more than a ton of crude rubber per month from May until the end of the year. All these, together with the very notable increase in the domestic demand, required manufacturers to push their works to full producing capacity. They had the same difficulty as manufacturers in other countries, owing to the greatly advanced cost of compounding ingredients. For instance, golden antimony and crimson antimony, because of the absence of imports from Great Britain, rose from 1 yen 20 sen [60 cents] a pound, to 4 yen [\$2] by the end of the year. These materials became so scarce that cinnabar was used as a substitute, and this has also advanced greatly in price because of the heavily increased demand for mercury. Zinc white, which cost 12 yen [\$6] per hundred weight in March and April, was quoted at 42 yen [\$21] by the end of the year, and machines, molds—in fact, nearly everything in the way of equipment, show proportionate advances.

CHANGES IN THE INDUSTRY.

Quite a number of new rubber factories were established in Japan during the past year. Seven of these are in Tokyo, eight in Osaka, Kobe and Hyogo. They are here listed.

Taisho Rubber Co., Ltd., Kitakamata, Tokyo. Capital \$25,000. Rubberized fabrics and goods.

Saito Rubber Cloth Works, 3 Chome, Kayabacho, Honjo, Tokyo.

Nipon Cristall Rubber Works, Tarashima, Tokyo. Dipped goods.

Chuo Rubber Co., Ltd., Komagomi-Sakashitacho, Tokyo. Capital, \$100,000. Molded specialties.

Kamada Rubber Works, Kami-Komagomi, Tokyo. Toy balls, heels, etc.

Taiheiyu Rubber Co., Kami-Meguro, Tokyo. Capital, \$60,000.

Kimura Rubber Works, 812 Somei, Tokyo. Soles, etc.

Hanhoku Rubber Works, Ebie, Sagisu-gun, Osaka. Capital, \$25,000.

Sango Shokai Rubber Works, Imamiya, Osaka.

Hinomaru Electric Wire & Rubber Co., Satsumabori-Minamicho, Osaka. Tires and insulated wire manufacture.

Kamada Rubber Manufacturing Co., Osaka.

Niwa Shoten Rubber Works, Osaka.

Futaba Rubber Co., Ltd. Fukiai-Kunika-dori, Kobe. Tires.

Toa Rubber Industry Co., Sugawara-dori, Hyogo. Capital, \$7,250.

Morinaga Rubber Works, Shiri-ike, Hyogo.

During the year the following concerns ceased business:

Nakajima & Co. (Tokyo), sold out to Saito Rubber Cloth Co.

Chuo Rubber Co. (Kami-Orchial, Tokyo), whose factory was destroyed by fire and not rebuilt.

Kanto Rubber Cloth Co. and Teikoku Rubber Co., Limited (both in Tokyo), and Osaka Rubber Works, failed in business.

Teat & Co. (Kobe) is succeeded by the Standard Rubber Co.

It will thus be seen that though there were some trade misfortunes during the year, there is really an increased number of concerns in Japan who are manufacturing rubber goods of one description or another.

RUBBER CONDITIONS IN CEYLON.

By a Special Correspondent.

THE year 1915 was a very prosperous one for the rubber trade in Ceylon. Export figures show a remarkable expansion over 1914. Rubber exported from the island in 1915 amounted to 45,143,735 pounds as compared with 36,235,114 pounds in 1914, showing an increase of 8,908,621 pounds. Considering the restricted facilities of freight, these exports are truly remarkable, in regard to both demand and production.

A striking feature of our exports of crude rubber in 1915 is that the United States figures show an increase of 100 per cent over the previous year's record, being 18,585,890 pounds in 1915, as compared with 9,187,191 pounds in 1914.

Australia took 844,977 pounds of Ceylon rubber, as compared with 619,175 pounds in 1914. Offsetting these increases in part, the exports of crude rubber to the Continent of Europe show a decrease from 4,448,560 pounds in 1914 to only 925,732 pounds in 1915.

Russia purchased more Ceylon rubber in 1915 than in 1914. During 1915 we shipped to Russia 332,200 pounds of crude rubber as against 105,212 pounds in the previous year.

A feature of the Ceylon rubber trade in 1915 was the forward contracts by private treaty, large sales having been effected for 1916 at a rate of about 2.05 rupees [\$0.67] per pound. The subject of these forward contracts is being much discussed. We learn from London that shareholders rarely fail to criticize such contracts if there be a subsequent improvement in the price of rubber; at the same time, complaints are usually recorded if no contracts are made and the price of rubber afterwards declines. It is generally believed here that forward sales should be made whenever the price secured insures a reasonable profit. It is argued that selling forward is of importance to manufacturers, who can thus cover contracts for delivery of manufactured goods extending over a very long period and that, therefore, forward sales induce manufacturers to give preference to plantation rubber.

SCHOOL OF TROPICAL AGRICULTURE.

Probably one of the greatest events in the modern history of agriculture in Ceylon occurred on Saturday, January 15, when the School of Tropical Agriculture at Peradeniya was formally inaugurated by Sir Anton Bertram. The scheme was nearly 16 years old and was originated by Sir West Ridgeway, who first appointed a commission to consider what should be done with the Agricultural School then at Colombo. The object of the new school is to bring agricultural education within the reach of the natives.

UDAPUSSELLAWA PLANTERS' ASSOCIATION.

This association held its annual meeting on January 16. According to its report the year just closed was an exceptional one, the crops of every estate showing a gain over 1914. This was doubtless due to a continuance of rainfall during June, July and August.

SALE OF RUBBER SHARES.

When the little boom of rubber shares in London occurred, late in 1915, colonial holders of such shares were placed at a distinct disadvantage, compared with their British fellow-investors, because of the ruling of the Home Government that unless holders of stock residing abroad could prove physical possession in Great Britain on September 14, 1914, they would not be permitted to sell their holdings in the London market. Because of this disadvantage shares can be purchased in Ceylon at a lower rate than is possible in London, but, as a matter of fact, there are practically no sales of sterling shares here. The British Government can prevent the sale of rupee shares in London, but they cannot prevent London purchasers remitting money to Ceylon and having rupee shares purchased here on their account.



CEYLON TAPPER PARING THE CUTS.

Thus the purpose of the government's restriction, the prevention of sending money out of Great Britain, is frustrated, and purchases of shares continue, in spite of this legal obstacle.

RUBBER EXPORTS TO AMERICA.

In the latter part of January a rumor reached us from London that the export of crude rubber direct to America from British ports in the East was to be prohibited. This report caused some commotion, but was generally received with skepticism, for many of us believe that Mincing Lane has certain reasons for readily accepting any reported embargo on direct shipments from the East. As far as I have been able to learn from investigations here, all that has happened up to the present is an increased difficulty in obtaining permits from London. Should the rumored prohibition actually go into effect, shippers here would find themselves in the same position as at the outbreak of the war, when a similar prohibition was actually put into effect. This embargo was short-lived, but, had it lasted, it is probable that its effects would not have been too severe upon

our exporters, as our rubber would have continued to reach the United States via London.

Here at Ceylon, we are aware that some rubber has found its way from the United States to Germany, but we cannot see in this the necessity of discriminating against direct exports from Eastern ports, and it is difficult to see how there can be less control over shipments received in America from the East direct, than over those passing through London. We feel that it is entirely a question of the American manufacturers keeping their faith with the British Government and not permitting rubber to get into the hands of German agents. If the American manufacturers have failed to protect what are in fact their own interests we cannot blame the British Government for taking whatever steps they believe necessary to prevent our rubber reaching the enemy.

However, from all one is able to learn here, there is no question of prohibiting the export of rubber from here to America, but the applications for export permits have become so numerous that it has been found necessary to do something to check the movement. Already this year large quantities of rubber have been loaded here for New York, San Francisco, Seattle and other American ports. During the past few weeks applications for export permits have been received in such large quantities in London that, had all of them been granted, the result would have been that practically the entire output of the East in the period in question would have been shipped to the United States.

BROOMHALL'S RUBBER CODE.

Soon after the outbreak of the war, the British Government prohibited the use of cable codes in foreign cablegrams. Later, concessions were allowed for all recognized codes, including Broomhall's Code for general purposes, but not the Rubber Edition. This omission, which was solely due to lack of agitation on the part of those interested, has been corrected and the British authorities now sanction the use of Broomhall's Rubber Code, which is much used by the rubber interests here.

PLANTERS' ASSOCIATION OF CEYLON.

The 62nd annual meeting of this association was held recently, and the report submitted by the committee for the year 1915 touched several interesting subjects. The first half of the year was quite favorable for harvesting rubber crops, but the remainder was decidedly unpropitious, the production of most of the rubber estates being far behind their estimates. It has been found that the cost of tapping decreases as the yield increases, and the following table was submitted as giving the average costs for several years:

200 pounds per acre.....	20 cents per pound
300 pounds per acre.....	17 cents per pound
400 pounds per acre.....	13-14 cents per pound
Over 400 pounds per acre.....	10-13 cents per pound

It was found that some of the diseases which attacked the rubber trees were more virulent the past year, the principal ones being bark canker, leaf fall or *gleo spormin*, and die-back or renewed bark. This latter was the most serious, and was particularly severe during the wet weather. Various remedial treatments are being used experimentally, but no definite report as to their success was given. The increase of acreage under cultivation was very small. Thinning out is being continued on most estates, and it is believed that later on not more than 80 to 100 trees will be the rule, it having been found that in properly thinned out estates disease is less common and bark renewal much more rapid. The shortage of potash has brought about changes in fertilizing mixtures. A fair average yield per acre was pronounced to be 350 pounds where estates had been intelligently thinned out and cultivated. A few cases showed yields amounting to 500 pounds per acre.

RUBBER PLANTING IN THE FEDERATED MALAY STATES.

THE growth of the automobile industry has brought about a steadily increasing demand for high grade rubber. The world was long dependent upon South and Central America and the Congo region in Central Africa for its supplies of wild rubber. This condition is greatly changed today due to the successful cultivation in the Far East of the Para rubber tree (*Hevea Brasiliensis*). The original experiments in rubber cultivation made in Kew, England, resulted in a new and prosperous development in the Far Eastern tropical regions. Nowhere in the world has the rubber tree been found to thrive more luxuriantly or to yield a more abundant flow of latex than in the Malay Peninsula. The growth of the industry has been so rapid in the past decade that it seems destined to outstrip tin mining as the leading industry of the Federated Malay States.

Rubber is the leading agricultural product of Malaya and the government, recognizing the importance of the new industry, has done much to encourage the taking up of land by planters. In the early days, loans were granted from the public funds, repayable on easy terms, and loans are still granted to approved applicants. One of the handicaps to the development of the country was the scarcity of labor. The native population was altogether inadequate to cope with the rapid rise of the rubber planting industry. The pioneer planters endeavored to overcome this difficulty by importing labor, mostly from India and China, and, to a lesser extent, from Java. The government has cooperated in this effort to increase the labor supply and now there is a steady influx of free imported labor supervised and regulated by government officials. There is a fairly constant ebb and flow among these laborers, but the treatment and wages they

and medical treatment of the laboring classes throughout the country. Water supply systems have been installed in new planting districts as fast as conditions permit. The ex-



COLLECTING LATEX.

cellent road system is rapidly extending to give access to new estates, and the railway department keeps pace with the agricultural development by opening up new territories and providing new sidings at convenient centers. An agricultural department under a highly qualified director and a staff of trained mycologists, entomologists and chemists cooperates with the planters in detecting and combating enemies of the rubber tree.

For all purposes other than mining, State land is alienated by the issue of a grant in perpetuity, or of a lease for a term not exceeding one hundred years, upon payment of premium or purchase money, in amount according to the position and nature of the property. An annual quit rent is also reserved in all cases, which rent may be revised periodically at intervals of thirty years. Everything is done by the government to facilitate opening up the land by planters.

In order to encourage small capitalists to take up land in the Malay States, the government has set aside small blocks of land for planting purposes, and arrangements have been made for assigning four young men to the forests and agricultural departments for periods of six months. During this time they have the opportunity of acquiring knowledge of the country, the people, their language and customs, as well as familiarizing themselves with market conditions.

Bulletins of the agricultural department give valuable information in regard to rubber cultivation and other agricultural subjects.

The following statistics show the growth of the rubber industry in British Malaya:



TAPPING ON A MALAY PLANTATION.

receive causes every man and woman returning to India or China to advertise favorably the Malay States, which results in bringing an increasing supply of laborers to the country.

Quarantine stations have been established by the government, which also exercises a praiseworthy care in the housing

Year	Average under Roupees	Quantity Exported Pounds.
1905	50,000	1,927
1906	99,230	935,056
1907	179,227	2,278,870
1908	241,138	3,539,922
1909	292,035	6,741,509
1910	362,853	14,368,863
1911	542,877	24,904,043
1912	621,621	42,462,401
1913	637,747 approx.	52,557,409
1914	653,873 approx.	68,761,280
1915	670,000 approx.	99,733,760

Rubber Planting Notes.

DECLINE OF WILD RUBBER IN FRENCH INDO-CHINA.

WITH the development of Eastern rubber plantations, the gathering of wild rubber is becoming a rapidly declining industry. The recently published report of a French military, geological and topographical commission which explored the Laos country of French Indo-China in 1913, contains interesting notes on rubber gathering.

The Laos country is located in the French protectorate of Annam and Siam and embraces all the upper reaches of the Mekong river. Rubber vines, which furnish most of the crude rubber that is exported from Vinh and other ports of Annam, grow wild in the forests covering the slate hills of the central districts of the Laos country.

In these rubber districts most of the natives neglect all agricultural pursuits to devote themselves exclusively to the gathering of rubber, which they sell to French traders in such centers as Luang-Prabang, Vientiane, Xiengkhouang, Kham-Keut and Na-Pe.

The rubber sold at Luang-Prabang comes from Muong-Phoun, from the valley of the Nam-Ta (Vien-Poukha) river and also from the forest districts of Siam. The Siamese rubber is carried on pack elephants to Thadua and from there down the river to Luang-Prabang.

The rubber marketed at Vientiane is obtained partly from the Muong-Phoun district and from the Pou-Nieni mountains, which are parallel to the Mekong, south of Muong-Phoun. Xiengkhouang, Kham-Keut and Na-Pe receive their rubber from the mountains near Muong-Mo as well as from the Muong-Phoun district. The Muong-Phoun rubber reaches Xiengkhouang by pack horse caravans. The rubber purchasing season begins in January. In 1913 the natives were receiving from 1.20 to 2 Straits Settlements dollars per kilogram [30 to 50 cents per pound] for dry rubber.

From the trading centers the rubber is sent by river boats and parcel post to the ports of shipment on the seaboard.

The French explorers were unable to obtain any definite figures as to the quantities of rubber handled at the different trading points, but they learned that Xiengkhouang was by far the leading center and that Luang-Prabang was second in importance. Also that the industry was fast declining owing to the destructive methods of the native gatherers.

RUBBER WASHING IN WEST AFRICA.

At the present time difficulty is being experienced in the *Manihot* rubber industry in West Africa, apparently due to the over-washing of the product. *Manihot* rubber should be treated differently than *Hevea*, as it is much more resinous than the latter and is consequently softer. Repeated washings are said to result in loss of "nerve" and cause the formation of oxidized films, rendering the rubber unsuitable for first-class manufacture. Too extended drying in the producing country has been suggested as the cause of the oxidation of the rubber, as the water in *Manihot* rubber is supposed to contribute to its preservation.

South Cameroon rubber acts in a somewhat similar manner. It comes in small cubes that are damp and lose 30 per cent in weight. This rubber has long given good results to manufacturers. It is purchased by trade-marks and without samples.

EXPORT TARIFF ON CRUDE RUBBER FROM BRITISH EAST AFRICA.

The British "Customs Tariff Amendment (No. 3) Ordinance of 1915" reduces the export duty on rubber other than plantation rubber, from the British East Africa Protectorate, from 10 per cent ad valorem to 4 per cent ad valorem.

PUBLICATION OF "ALL-IN" COSTS BY RUBBER PLANTATION COMPANIES.

Rubber plantation companies, in general, place the so-called "all-in" cost of production of rubber before their shareholders. Opinions are divided, however, as to the wisdom of giving these details to the public. Officials of some plantation companies believe it injudicious to enable purchasers to learn the cost of production, reasoning that a buyer paying \$1.00 for an article which to his knowledge costs but 25 cents to produce will naturally make it his aim to reduce as much as possible the profit he knows the seller is making. By boasting of the low cost of production the rubber grower arms the rubber dealer with a weapon which the latter will use against him. The practice of publishing "all-in" costs is certainly peculiar, for in few other lines of business it is customary to take the public so completely into confidence as to the costs of production.

WORLD'S ACREAGE OF PLANTATION RUBBER.

It is estimated by the Rubber Growers' Association of London that the total area of planted rubber is approximately one and a half million acres, which is divided as follows: Malaya, 670,000 acres; Ceylon, 224,000 acres, Dutch East Indies, 517,000 acres; Southern India and other countries, 90,000 to 100,000 acres.

PARA RUBBER SEED.

According to the "Gardens' Bulletin," Straits Settlements, from observations over a period of eighteen years at the Botanic Gardens, Singapore, it is estimated that about 1,400 trees are required to yield 2,000 pounds of Para rubber seed, or 1,200 pounds of kernels. It was further noted that a large crop of seed is usually followed by an insignificant crop at the next seeding.

RUBBER PLANTING IN ST. LUCIA, B. W. I.

According to the annual report of Archibald J. Brooks, F.L.S., F.C.S., agricultural superintendent for St. Lucia, British West Indies, labor conditions in that island render the cultivation and preparation of rubber unprofitable although both *Castilloa elastica* and *Hevea Brasiliensis* grow and thrive well on the island. Samples of *Castilloa* rubber grown in St. Lucia were sent to the Imperial Institute in London, which reported it to be of good quality although of undesirable dark color and a rather high percentage of resin.

THE BATAVIA, JAVA, RUBBER TRADE ASSOCIATION.

This association recently published its first report, which covers the year 1915. Starting with 40 subscribers, 67 new ones were registered in the course of the year, bringing the total on December 31, 1915, to 107.

During the year covered by the report 21 auctions were held, rubber to the amount of 262 tons was offered, and 136 tons sold.

The report makes no mention of forward sales in Java during 1915, although there are reasons to believe many such sales were made.

BALATA POACHERS.

Some time ago seven or eight balata bleeders deserted from the service of the British Guiana Companies, crossed the Rupununi Savannah to the Brazilian side of the Takutu river, and there began bleeding operations on their own account. Using the old-time destructive methods of cutting down the bullet-trees, they soon had collected a considerable quantity of balata, estimated at 10,000 pounds, and are now reported to be on their way down the Rio Branco for Manaus.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED FEBRUARY 15, 1916.

- N**O. 1,171,444. Retraining of castings. Cornelius D. McGhiehan, Jersey City, N. J.
- 1,171,502. Vehicle tire. W. L. Burgess, assignor to the Firestone Tire & Rubber Co.—both of Akron, Ohio.
- 1,171,563. Demountable rim. H. N. Gougher, Fall River, Mass.
- 1,171,597. Hard rubber storage battery separator. J. N. Davis, Denver, Colo.
- 1,171,652. Fountain pen. V. V. Riesberg, assignor of one-half to F. H. Dougherty—both of Philadelphia, Pa.
- 1,171,664. Metal reinforced rubber valve disk. W. F. Schacht, Huntington, Ind.
- 1,172,100. Fountain pen. C. M. V. Allenou, Nantes, France.
- 1,172,153. Spring wheel with cushion tire. C. S. Martin, Rockville, Md.
- 1,172,197. Hot water bag. C. P. Cook, Marshalltown, Iowa.
- 1,172,234. Resilient wheel with rubber cushioned hub. J. B. Drahonovsky, assignor to J. B. D. Holding Co.—both of Milwaukee, Wis.
- 1,172,244. Demountable rim. C. H. McKendree, assignor of one-tenth to E. H. Smith, one-tenth to F. P. Lane, one-tenth to W. A. Mansfield, one-tenth to C. D. Arthur, and one-tenth to M. Samuels—all of Lakeview, Ore.

ISSUED FEBRUARY 22, 1916.

- 1,172,287. Locking device for demountable automobile wheel rims and the like. F. D. Huber, Jr., Webster Groves, assignor to Hil-Ko Rim Lock Co., St. Louis—both in Missouri.
- 1,172,392. Rubber heel plate. H. G. Robinson, Oakland, Cal.
- 1,172,433. Rim for vehicle wheels. R. S. Bryant, assignor to The Standard Welding Co.—both of Cleveland, Ohio.
- 1,172,450. Pneumatic suction cleaner employing a length of rubber tubing. W. J. Griffin, assignor of one-third to A. A. Hancock—both of Washington, D. C.
- 1,172,472. Safety valve for pneumatic tires. G. Mizener, Decorah, Iowa.
- 1,172,506. Rubber footwear retainer. T. C. Wilder, Cattaraugus, N. Y.
- 1,172,543. Piston rod packing formed of alternate interlocked layers of fabric and rubber. C. I. E. Mastin, Midland Park, N. J.
- 1,172,552. Waterproof thigh guard. G. L. Pierce, Brooklyn, N. Y., assignor to A. Spradling & Bros., New York City.
- 1,172,573. Emergency tire composed of links and block fillers. A. J. Westburg, Springfield, Ill.
- 1,172,610. Resilient wheel. M. F. Kettler, assignor to Downing Pneumatic Wheel Co.—both of Houston, Tex.
- 1,172,671. Detachable rubber heel for footwear. C. H. Chapman, Winchester, Mass., assignor to Chapman Detachable Rubber Heel Co., a corporation of Maine.
- 1,172,879. Apparatus for administering oxygen to persons in a state of collapse by asphyxiation or other causes. R. H. Davis, London, England.
- 1,172,889. Dyeing comb having a compressible reservoir. C. M. Holden, San Francisco, Cal.
- 1,172,927. Combination bathing cap and bag. F. A. Bloch, New York City.
- 1,172,966. Elastic waist adjusting band. W. C. Hynard, assignor to Hynard & Jung Co.—both of New York City.
- 1,173,008. Pressure regulator for pneumatic tires. G. D. Lewis, Genesee, Pa.
- 1,173,032. Tooth brush formed of a plurality of indented elastic layers. H. Reiche, Milstone, N. J.
- 1,173,061. Fire hose coupling. N. Treigle, Hancock, Mich.
- 1,173,085. Moistening device with perforated rubber top. D. G. Beeching, New York City.
- 1,173,088. Friction pull rubber heel. F. Berenstein, Chelsea, Mass.
- 1,173,124. Rubber tread vehicle wheel. E. G. Schleicher, Stamford, Conn.

ISSUED FEBRUARY 29, 1916.

- 1,173,176. Nursing bottle and nipple. M. C. Coombs, New York City.
- 1,173,211. Spring hose coupling. W. F. O'Donnell, Trenton, N. J.
- 1,173,221. Split rim for vehicle wheels. N. Schenk, St. Louis, Mo.
- 1,173,222. Demountable rim for vehicle wheels. N. Schenk, St. Louis, Mo.
- 1,173,243. Combination demountable rim and felly band. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.
- 1,173,287. Rubber welt for shoes. J. E. Lucas, Brockton, assignor to F. E. Woodward, Waban—both in Massachusetts.
- 1,173,349. Pocket elastic comprising an endless elastic band. J. W. Hawkins, Mundfordville, Ky.
- 1,173,424. Demountable tire tread. C. A. Hagstrom, Kansas City, Mo., and E. E. Hagstrom, Chicago, Ill.; assignor to Hagstrom assignor to said G. A. Hagstrom.
- 1,173,482. Inflatable life preserver. C. O. Carlson, Manor, Tex.
- 1,173,502. Combined pneumatic tire and protector. J. F. Geisendorfer, Wesmar, Calif.
- 1,173,528. Trepanner and set of cutters for sponge rubber. I. R. Roberts, Rochester, N. Y., assignor to Underwood Typewriter Co., New York City.
- 1,173,561. Bath mat. E. R. Crooker, Los Angeles, Calif.
- 1,173,596. Health shoe comprising a strip of elastic material adapted to act as an arch support. H. Zeig, assignor of one-half to H. J. Rosecrant—both of Philadelphia, Pa.
- 1,173,755. Collapsible drinking cup. W. O. Straight, Pullman, Wash.

- 1,173,755. Arch-shaped supports & flanges of cushions interspersed in animal formations. I. A. Usmanian, assignor to G. O. Frommann—both of Chicago, Ill.
- 1,173,814. Resilient wheel tire. J. L. Plant, Malone, N. Y.
- 1,173,853. Protector for pneumatic tires. W. H. Paul, Baltimore, Md.
- 1,173,865. Fountain pen. F. C. Ries, Macon, Ga.
- 1,174,028. Resilient vehicle tire. W. B. Buckley, Washington, D. C.

ISSUED MARCH 7, 1916.

- 1,174,054. Boot or shoe comprising a rubber inner-sole of silk and a sole of rubber vulcanized to the sheet. G. F. Butterfield, assignor to G. L. Butterfield—both of West Newton, Mass.
- 1,174,109. Hard rubber mouthpiece for smoking pipes. O. Wartemann, New York, assignor to Traun Rubber Co., College Point—both in New York.
- 1,174,117. Tire valve. J. A. Bowden, Los Angeles, Cal., assignor to A. Schrader's Son, Inc., New York City.
- 1,174,166. Rubber hip boot. W. P. Kilner, Buffalo, N. Y.
- 1,174,168. Tire valve. H. P. Kraft, New York, and M. C. Schweinert, West Hoboken, N. J.
- 1,174,170. Pneumatic tire comprising superimposed laminations of rubber and metal. M. E. Lessem, Cape Girardeau, Mo.
- 1,174,179. Hot water bottle, stopper and heating attachment. C. A. Richards, Chicago, Ill., assignor to A. Schrader's Son, Inc., New York City.
- 1,174,278. Pneumatic tire casing. B. C. Dowse, Cudahy, Wis.
- 1,174,284. Tire repair device. C. F. Jenkins, Washington, D. C.
- 1,174,350. Twin tire wheel rim. A. A. Remington and J. G. Sweeney—both of Birmingham, England.
- 1,174,386. Rubber gasket with inner ring. G. M. Shaffer, Denver, and E. A. Franklin, Fort Morgan—both in Colorado.
- 1,174,380. Wheel rim. W. P. Bailey, Mill Valley, Calif.
- 1,174,397. Sole pressing form comprising a rubber pad. H. A. Davenport, Brockton, Mass., assignor to United Shoe Machinery Co., Paterson, N. J.
- 1,174,430. Horseshoe pad. A. McTernan, Andover, and J. A. Hale, Boston, assignors to McTernan Rubber Manufacturing Co., Reading—both in Massachusetts.
- 1,174,476. Pneumatic tire protector. B. Cohen, New York City.
- 1,174,556. Inflatable life preserver. B. Franklin, assignor to American Life Buoy Co.—both of Chicago, Ill.
- 1,174,557. Inflatable life preserver. B. Franklin, assignor to American Life Buoy Co.—both of Chicago, Ill.
- 1,174,619. Rubber heel retaining grip. W. M. Scholl, Chicago, Ill.
- 1,174,620. Cushion heel. W. M. Scholl, Chicago, Ill.
- 1,174,621. Resilient heel. W. M. Scholl, Chicago, Ill.
- 1,174,780. Smoke helmet with air tube and respirator. J. A. Tychon, Cloquet, Minn.
- 1,174,799. Method of repairing boots and shoes. J. W. Arthur, Warren, Ohio.
- 1,174,856. Filler for automobile tires. F. A. Hager, Portland, Ore.
- 1,174,909. Tire shoe or casing patch. G. L. Stuart, San Diego, Cal.

ISSUED MARCH 14, 1916.

- 1,174,954. Rubber shoe in hand form. M. O. Anthony, assignor to The Telegraph Co.—both of New York City.
- 1,174,968. Wheel rim. D. J. Canary, Oak Park, assignor of one-half to C. M. Richter, Chicago—both in Illinois.
- 1,174,976. Adjustable elastic band for garments and the like. T. R. Games, Montreal, Quebec, Canada.
- 1,175,054. Nipple for nursing bottle. H. C. Dunfee, St. Albans, W. Va.
- 1,175,055. Resilient wheel comprising a pneumatic tube. J. L. Firm, Berwyn, Ill.
- 1,175,063. Spring. S. G. Walker, assignor of one half to R. Ruffner—both of Welch, W. Va.
- 1,175,177. Resilient vehicle wheel with solid rubber tire. S. Johnstone, Sacramento, Calif.
- 1,175,154. Cushion tire. A. S. Krotz, Janesville, Wis.
- 1,175,240. Elastic garment support. F. A. Cook, Grand Rapids, Mich.
- 1,175,249. Detachable massaging device for brushes and the like. F. Eisenhut, Newark, N. J.
- 1,175,373. Elastic tube for fire hose. H. C. Noack, Chicago, Ill.
- 1,175,387. Pedal pad. J. Stanley, Newark, N. J.
- 1,175,411. Demountable rim for tires. F. J. Croop, Warsaw, Ind.
- 1,175,431. Cushion tire. J. R. Gammeter, Akron, Ohio, assignor to The B. E. Cushman Co., New York City.
- 1,175,491. Bathing appliance. J. Wald, New York City.
- 1,175,532. Hose coupling. C. H. Lambkin, New York City.
- 1,175,606. Cushioning material for absorbing shock. L. P. Clutter, Beaver Falls, Pa.
- 1,175,624. Tire casing formed of layers of rubber and granular particles of alumina distributed between the layers of fabric. J. H. Fawkes, Portland, Ore.
- 1,175,671. Reusacitor comprising a sheet of flexible elastic material. T. E. Acklen, Memphis, Tenn.
- 1,175,684. Detachable resilient heel. A. Beckelman, New York City.
- 1,175,799. Respirator. F. Niessner, Johnston, Pa.
- 1,175,866. Integral rubber shoe comprising a forepart, a thicker heel portion and a connecting shank portion. C. H. Hill, Lynn, Mass.

- 1,175,884. Boot cap for valve stems. G. L. Fisher and A. Bailey—both of Philadelphia, N. J., assignors to Revere Rubber Co., Providence, R. I.
 1,174,995. Apparatus for impregnating tire fabric. E. W. Kriemer, Carlstadt, N. J.
 1,175,517. Machine for forming hose bands. H. Gibbs, assignor to W. D. Allen Manufacturing Co.—both of Chicago, Ill.
 1,175,681. Pneumatic tire mold. G. E. Batcheller, New York City.

THE DOMINION OF CANADA.

ISSUED DECEMBER 31, 1915.

- 166,447. Rubber gloves. The Sterling Rubber Co., assignee of J. B. Alden—both of Cuchib, Ontario, Canada.
 166,468. Tread for footwear. P. G. Dunham, Tilbury, Ontario, Canada.
 166,497. Vehicle tire fitted with interior spring blocks in place of an inner tube. V. Mongeau, Outremont, Montreal, Quebec, Canada.
 166,515. Suction tread for footwear. R. Smith, Sherbrooke, Quebec, Canada.
 166,521. Tire pressure regulator. C. H. Thayer, Jamaica, New York City.
 166,554. Hollow resilient automobile tire. The Ruckings Tyre Syndicate, Limited, Westminster, assignor to H. Diamant, 14 Westbourne Terrace Road, Middlesex—both in England.
 166,593. Elastic inserts for skirt bands. E. Canlan, Philadelphia, Pa.
 166,597. Pneumatic tire for automobiles. W. Henry, Clay, Cameon, Colo.
 166,635. Nursing brassiere having a front portion of light waterproof material. L. Lawrence, Vancouver, British Columbia, Canada.
 166,671. Military coat. The Canadian Consolidated Rubber Co., Limited, assignee of L. Federman—both of Montreal, Quebec, Canada.
 166,718. Air tube for pneumatic tires. J. A. Burgess, Toronto, Ontario, Canada.
 166,754. Curtain device for bath tubs. A. E. Lang, Buffalo, N. Y.
 166,879. Tire core. H. J. S. Keim, Catsaspa, Pa.
 166,899. Automobile tire tool. W. J. Reid, Gananoque, Ontario, Canada.
 166,905. Tire inner tube. E. L. Scranton, Rising Sun, Ind.
 166,906. Cushion tire. W. Shimon, Pocahontas, Iowa.
 166,920. Tire comprising an outer casing of rubber and a filler of hollow rubber balls. H. E. Wolken, Leitch, Nebraska.

THE UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent upon the filing of the application.

Includes Patents for American Inventions.

- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, FEBRUARY 16, 1916.]
 21,241 (1914). Device for wiping automobile glass wind shield. E. Black, 188 Clarendon Park Road, Leicester.
 21,312 (1914). Parachute with waterproof casing and rubber rings. E. R. Calthrop, Eldon Street House, Eldon street, London.
 21,386 (1914). Life saving apparatus comprising a waterproof bag. P. M. Freely, 11 Bonner place, New York City.
 21,458 (1914). Toy with rubber tubular legs. J. Isaacs, Highgate Park Works, Alcester street, Birmingham.
 21,489 (1914). Apparatus with rubber mouthpiece and gas bag for administering gases. P. S. O'Donnell, Plaza Hotel, Chicago.
 21,491 (1914). Apparatus for drying rubber. H. E. C. Van Hook, 36 Himble Road, Harrow, Middlesex, and A. D. Wheatley, 26 South Audley street, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, FEBRUARY 23, 1916.]
 21,502 (1914). Infatigable swimming belt, etc. J. J. Pritchard, 4 Reddings Road, Moseley, Birmingham.

- *21,535 (1914). Tire casing with cork filling. E. M. Deal, 5213 Spruce street, and I. J. Brooks, 304 South Tenth street—both in Philadelphia.
 21,616 (1914). Rubber padded non-slip attachment for horseshoes. A. J. Sumner, Blanford Villa, Cheltenham, Gloucestershire.
 21,633 (1914). Protective band for inner tubes. E. K. Fuller, Hemmingsford Grey, St. Ives, Huntingdonshire.
 21,656 (1914). Combined waterproof cloak and sleeping bag. M. Earle, 53 Queen's Road, St. John's Wood, London.
 21,767 (1914). Endless handband, belt, garter, etc., having an elastic section. R. Neill and P. Isles—both of 20 Great Charlotte street, Liverpool.
 21,778 (1914). Flexible rubber connection for coupling metal pipes. J. S. Irving, Kenilworth, Osborne Road, South Farnborough, Hampshire.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MARCH 1, 1916.]
 21,850 (1914). Waterproof trench coat adapted for wear under an overcoat. Also for use as a swimming sheet. A. H. Milly, trading as A. H. Milly & Co., 9 Grace street, and E. C. Laverack, 130 Hyde Park Road—both in Leeds.

- *21,867 (1914). Milking machine test cups, the lining of which consists of a plain rubber tube. C. H. Davis, 10 Church Place, Wanganui, New Zealand.
 21,874 (1914). Balata impregnated driving and conveyor belts. Aktieselskabet Rolund's Fabrikker, 19 Sortebroetorvet, Odense, Denmark.
 *21,890 (1914). Fountain syringe for irrigation purposes. Meinecke & Co., 48 Park Place, New York City, assignees of C. W. Meinecke, 31 Sherman Place, Jersey City, N. J.
 21,930 (1914). Waterproof apron for use on carriages, etc. A. W. Austen, 48 A Station Road, Maidstone.
 22,031 (1914). Blanket capable of being converted into a sleeping bag or waterproof cape. D. F. Burrage, "Langmoor," Egmont Road, Sutton, Surrey, and Lottbury Supply Association, 5 Moorgate street, London.

- 22,059 (1914). Guard for fountain pens to be attached to the wearing end by an elastic cord. W. Farquhar, 40 Westbourne Gardens, Bayswater, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MARCH 8, 1916.]

- 22,117 (1914). Device for lessening effects of collisions comprising rubber rings and padding. P. Penza, 17 Via Barbaziana, Bologna, Italy.
 22,214 (1914). Hose nozzle with rubber disk. M. Buckley, 8 Brook street, Thornton Lodge, Huddersfield.
 *22,262 (1914). Vehicle spring with rubber bumpers. J. Frosig, 751 West Fourth street, and J. W. Walsrom, 611 Eureka avenue—both in Reno, Nev.
 22,267 (1914). Life-saving waistcoat with an inflatable tube of rubber. Gieve, Matthews & Seagrave, 2 The Hard, Portsmouth, and W. Gieve, 65 South Molton street—both in London.
 22,401 (1914). Toy. H. D. Evans, 8 Brockenhurst Gardens, Addiscombe, Croydon.
 22,433 (1914). Rubber bands used in laying subterranean mines. Soc. Schneider et Cie, Le Creusot, Saone et Loire, France.

THE GERMAN EMPIRE.

PATENTS ISSUED (With Dates of Validity).

- 290,213 (August 19, 1913). Surgical sewing material. Supplement to patent 287,400. Firm of M. Esbach, Klingenthal-in-Sa.
 290,216 (May 8, 1914). Packing disc. Firm of Paul Lechler, Stuttgart.
 290,217 (December 10). Resilient tire. Ennemann-Darmstadt and John Joseph Brooks, Philadelphia, Pa., U. S. A. Represented by M. Schmetz, Patent Lawyer, Amstelschloß.
 290,730 (March 19, 1912). Stamped fastening button for attaching rubber hose to rubber machines and dams. Adolf Fuchswald, 162, Hauptstrasse, Berlin-Schöneberg.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

- 477,823 (June 26, 1915). Elastic tire for vehicle wheels. T. H. Kep.
 477,853 (March 2). Elastic wheel for automobiles, motor cycles and other vehicles. Miss E. Murray.
 477,887 (March 5). Improved elastic tires. L. E. Pickett.
 477,997 (May 12). Improved buffer springs, coupling springs and others, made up with rubber. F. Spencer.
 478,050 (March 16). Pneumatic tire casing. D. R. Shewan.
 478,067 (March 17). Improved anti-skid devices for automobile wheels. The National Seal Car Co., Limited, and Crawley-Bovey.
 478,093 (March 19). Elastic wheel with a hollow rim. DeLaudance y Salazar.
 478,100 (March 20). Improvements in vehicle wheels. S. Ramsbotham.
 478,161 (March 26). Mud guard for automobiles and other vehicles. P. Christensen.
 478,216 (March 31). Improvements in elastic wheels for vehicles. B. O. Bergensen.
 478,224 (July 24, 1914). New application, to the wheels of automobiles and other vehicles, of means to decrease the heating of the rubber, the "blowing out" of pneumatic tires and to make and replace parts of tires. J. A. Monseaux.
 478,231 (April 1, 1915). Elastic tire with segments rings, for vehicle wheels. F. Thonier.

NEW ZEALAND.

ISSUED JANUARY 20, 1916.

- 36,807. Pneumatic proof inner tube. A. E. Henderson, 503 Kent Building, Toronto, Canada.

TRADE-MARKS.

THE UNITED STATES.

ISSUED FEBRUARY 15, 1916.

- 81,399. Abercrombie & Fitch Co., New York City. The initials A & F. For tennis balls, footballs and sporting goods.
 88,841. The Mechanical Rubber Co., Jersey City, N. J. The word *Champion*. For garden hose composed of rubber and rubber fabric.
 90,028. The Portage Rubber Co., Barborton, Ohio. The word *Summit*. For rubber vehicle tires.
 90,620. Samstag & Hilder Bros., New York City. Illustration of a seal with a crown and lion for the word *Colonial*. For dress shields, hose supporters, rubber hair pins, etc.
 91,163. Franklin-Caro Co., Richmond, Va. Representation of a beehive and a bee with the words *Honey Fruit*. For chewing gum.
 91,775. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Sheba*. For light weight rubber shoes.
 91,776. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Ada*. For light weight rubber shoes.
 91,777. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Sheba*. For light weight rubber shoes.
 91,882. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Amey*. For light weight rubber shoes.
 91,884. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Inez*. For light weight rubber shoes.
 91,885. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Smiley*. For light weight rubber shoes.
 91,886. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Kema*. For light weight rubber shoes.

- 91,887. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Fawn*. For light weight rubber shoes.
- 91,888. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Forest*. For light weight rubber shoes.
- 91,973. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Nemo*. For light weight rubber shoes.
- 91,974. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Tris*. For light weight rubber shoes.
- 91,975. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Leds*. For light weight rubber shoes.

ISSUED FEBRUARY 22, 1916.

- 84,001. The B. F. Goodrich Co., New York City. The initial G between two sprigs. For raincoats and rubber boots and shoes.
- 90,685. United & Globe Rubber Manufacturing Co., Trenton, N. J. Illustration of a circle with the word *Proof*. For rubber hose, belting, packings, rubber dredging sleeves, etc.
- 90,782. Automatic Selling & Advertising Co., New York City. Illustration of a diamond printed in red and blue with the words *Al-Chew-Tra-Bis-Gum*. For chewing gum.
- 90,900. J. P. Gorman, New York City. Illustration of a chaffeur with the casing of a tire in his hands and the words *Rubber Putty* *Fast* *Traces* *Penetrating* *or* *Rubber*. For plastic compounds, called "Rubber Putty" for mending rubber articles.
- 91,959. Garter Plate Co., Inc., New York City. Representation of a garter with the word *King*. For garters.

ISSUED FEBRUARY 29, 1916.

- 88,743. G. W. Mettman, Bristol, R. I. The word *Vulcan*. For a pipe joint compound.
- 99,531. Pirelli & Co., Milan, Italy. Illustration of a circle with a star in the center of same and the initials *P & C M* and the word *Stella*. For surgical syringes.
- 90,857. United Drug Co., Boston, Mass. Illustration of a signet with the word *Signet*. For rubber goods.
- 91,666. J. P. Smith Shoe Co., Chicago, Ill. The illustration of a spear with the word *Chicagoan*. For shoes of canvas and rubber and of leather and rubber, etc.

ISSUED MARCH 7, 1916.

- 79,715. Maryland Rubber Co., Baltimore, Md. Illustration of a man with a globe on his shoulders with the word *Atlas*. For druggists' sundries.
- 90,670. The British Aeroplane Varnish Co., Limited, Newcastle-upon-Tyne, England. The word *Plano-line*. For preparation for the preservation and waterproofing of textile fabrics, leather, etc.
- 90,671. The British Aeroplane Varnish Co., Limited, Newcastle-upon-Tyne, England. The word *Tintine*. For filling and waterproofing material for the textile wings of aeroplanes, airships, and other aircraft.
- 91,069. The Goodyear's Metallic Rubber Shoe Co., Nauvauk, Conn. The word *Nauvasole*. For rubber boots and shoes.
- 91,488. E. L. Swaine, Los Angeles, Cal. Illustration of a series of miniature pictures with the words *Magic Gum*. For chewing gum.
- 92,030. United States Tire Co., New York City. The word *Usaco*. For rubber tires for vehicles.
- 92,072. United States Tire Co., New York City. The word *Royal*. For rubber tires for vehicles.

ISSUED MARCH 14, 1916.

- 90,769. C. W. Meinecke, New York City. Illustration of a nippie with a band around the neck of same and the words *Anti-Colic Brand*. For nippies.
- 91,428. Independent Gum Co., Memphis, Tenn. The word *Spearmint* in white letters on a black background. For chewing gum.
- 91,471. F. V. Canning, New York City. The word *Pepinets*. For chewing gum.
- 92,306. Samstag & Hilder Bros., New York City. A coat of arms with the word *Colonial*. For elastic webbing, etc. For chewing gum.

THE DOMINION OF CANADA.

ISSUED DECEMBER 31, 1915.

- 21,282. Canadian Consolidated Rubber Co., Limited, Montreal, Quebec. The word *Rubberhide* on the outline of the sole of a shoe. For footwear.
- 21,318. Gutta Percha & Rubber, Limited, Toronto, Ontario. The word *Efficiency*. For mechanical rubber goods.
- 21,334. Willard's Chocolate's Limited, Toronto, Ontario. The words *Butter Nut* on disk encircled by band bearing the words *Chewing Gum Brand*. For chewing gum.

DESIGNS.

THE UNITED STATES.

ISSUED FEBRUARY 15, 1916.

- 48,561. Tread surface for tires. P. S. Malickson, Philadelphia, Pa.
- 48,571. Pneumatic vehicle tire. R. G. Null, Indianapolis, Ind., assignor to G. & J. Tire Co., a corporation of New Jersey.

ISSUED FEBRUARY 22, 1916.

- 48,586. Rubber brush. O. Eick, St. Louis, Mo.
- 48,627. Rubber boot. M. H. Clark, Milford, Conn., assignor to The Good-year's Metallic Rubber Shoe Co., a corporation of Connecticut.
- 48,636. Pneumatic tire. R. Griffith, Akron, Ohio.

ISSUED MARCH 7, 1916.

- 48,690. Rubber tire. E. C. McGraw, East Palestine, Ohio.
- 48,730. Rubber tire. E. C. McGraw, East Palestine, Ohio.

THE DOMINION OF CANADA.

ISSUED DECEMBER 31, 1915.

- 3,948. Tread surface for rubber tires. Hyslop Brothers, Limited, Toronto, Ontario.

YEARLY EXPORTS AND IMPORTS OF CRUDE AND MANUFACTURED RUBBER BY COUNTRIES.

EXPORTS—CRUDE RUBBER.

		1914	
		Pounds.	Value.
Ceylon—			
To Great Britain	4,133,396	25,183,748	1,031,192
The Continent	4,309,79	18,607,691	119,913
United States	303,206	264,901	—
Strait Settlements	69,340	1,530	—
Japan	1,580	964,697	392,495
Australia	317,634	—	—
Canada & Newfoundland	124,422	—	—
Totals	69,366,080	46,566,187	—
Singapore—			
To Great Britain	29,326,477	29,934,533	—
The Continent	2,042,520	4,765,331	—
Japan	1,259,823	2,315,915	—
Ceylon	297,245	338,450	—
United States	10,732,448	48,340,967	—
Australia	175,964	372,459	—
Totals	43,834,177	86,667,657	—
Penang—			
To Great Britain	19,513,200	21,129,931	—
The Continent	333,333	801,590	—
Ceylon	905,333	516,666	—
United States	99,701	4,132,467	—
Totals	21,851,567	28,580,663	—
Port Swettenham—			
To Great Britain	27,683,992	28,188,454	—
The Continent	1,816,538	304,640	—
Ceylon	1,572,660	1,572,215	—
United States	244,209	—	—
Totals	31,286,399	29,785,309	—
Malacca—			
To Great Britain	5,265,628	7,881,651	—
United States	15,878	—	—
The Continent	36,873	17,333	—
Totals	5,318,379	7,898,984	—
Federated Malay States	69,366,080	99,776,500	—
Liberia	8,003	10,081	—
Brazil	75,109,440	78,769,600	—
Rangoon	710,189	\$429,120	\$429,120

EXPORTS—CHICLE.

Mexico—Tampico:			
To United States	—	347,817	\$87,718
Japan—			
From British India	406,676	\$223,637	1,114,441
Straits Settlements	1,646,356	678,730	2,017,176
Dutch Indies	13,034	1,678	863,593
Great Britain	224,500	159,312	332,164
United States	11,914	8,166	98,430
Totals	2,302,680	\$1,071,523	3,881,988

IMPORTS—CRUDE RUBBER.

From British India	406,676	\$223,637	1,114,441
Straits Settlements	1,646,356	678,730	2,017,176
Dutch Indies	13,034	1,678	863,593
Great Britain	224,500	159,312	332,164
United States	11,914	8,166	98,430
Totals	2,302,680	\$1,071,523	3,881,988

IMPORTS—GUTTA PERCHA.

		1913	
		Pounds.	Value.
Holland—			
From France	—	\$133,200	—
Great Britain	—	69,600	—
Dutch Guiana	—	783,600	—
Java, etc.	—	606,000	—
Other countries	—	94,800	—
Totals	—	\$1,741,200	—

IMPORTS—RUBBER MANUFACTURES.

		1914	
		Pounds.	Value.
Holland—			
From Belgium	—	\$932,200	—
Great Britain	—	3,419,200	—
Java	—	1,166,800	—
Germany	—	783,600	—
Russia	—	509,200	—
United States	—	36,400	—
Other countries	—	316,400	—
Totals	—	\$6,431,200	—

Rangoon—			
From United States	—	\$3,300	—
Totals	—	\$192,1913	—

Norway—			
From United States	—	\$19,613	—
Totals	—	\$192,1913	—

IMPORTS—GUTTA PERCHA MANUFACTURES.

		1913	
		Pounds.	Value.
Holland—			
From Belgium	—	\$231,200	—
Great Britain	—	62,400	—
Germany	—	160,800	—
Other countries	—	400	—
Totals	—	\$454,800	—
Newfoundland—			
From Great Britain	—	\$21,000	—
United States	—	66,000	—
Totals	—	\$125,000	—

Review of the Crude Rubber Market.

NEW YORK.

GENERALLY quiet tone has prevailed in the crude rubber market during the month of March. Trading has been steady and the volume of business comparatively small. The large manufacturers appeared to be limiting their purchases to moderate quantities, while dealers were equally conservative in their operations. Quotations were generally firm with minor fluctuations that resulted in an average decline of 2 to 3 cents during the month.

Shipments of plantation rubber from the East by way of the Pacific coast continue to increase. This is an entirely new route and just when the rubber in transit will reach its destination is uncertain. The intercontinental railroads are short of cars and congested with freight. Rubber that was shipped from the East in December last, is only just arriving, having consumed 8 to 10 weeks in transit across the continent. It is extremely doubtful, therefore, that very much rubber will be shipped in the future by this route.

New York arrivals have shown increasing volume. The total figures for the first three weeks of March were 6,200 tons divided as follows: Plantations from Singapore and Ceylon 1,670 tons; Batavia 645 tons; London and Liverpool 1,435 tons; Paras from Brazil 1,990 tons; West coast 35 tons; Africans 350 tons; Centrals 75 tons. Para sorts from Brazil appear to be in the lead thus far for the month. The present indications are that March arrivals will exceed those of February, which amounted to 6,885 tons. The steamship Suldanza da Gama cleared from Para for New York on February 5, with about 200 tons of rubber. This steamer has not yet arrived and according to rumors, never will, as the cargo is destined for Germany.

On March 1 First latex, nearby, was quoted at 92 cents, May-June deliveries sold at 90 cents and July-December at 86 cents. Amber and Brown crepes ranged from 87 cents to 90 cents, depending on the color and position. Smoked sheets, nearby, sold for 91 cents. May-June deliveries sold for 89 cents and July-December for 86 cents. Nearby Upriver fine and Upriver coarse were quoted at 77 cents and 60 cents, respectively. Nearby Islands fine and Islands coarse were quoted at 70 cents and 38 cents, respectively. Upper cauchó ball, nearby, was 60 cents. Cameta spot sold for 40 cents.

During the month the decline was noticed in the various sorts, and on March 30 First latex, nearby, sold for 88½ cents. Futures were not quoted. Amber and Brown crepes sold at 86 to 87 cents. Smoked sheets, nearby, were quoted at 88 cents. Futures were not quoted. Upriver fine and Upriver coarse were 74½ cents and 58 cents. Nearby Islands fine and Islands coarse were 69 and 38 cents. Upper cauchó ball, nearby, sold for 59 cents, and Cameta, nearby, 40 cents.

LONDON.

A review of the London market for the past month failed to disclose any unusual features worthy of special mention. The underlying tone has been quiet with prices firm and practically unchanged. The actual rubber movement during the past few weeks has been comparatively small. London plantation imports during February amounted to only 3,831 tons, as against 5,360 tons in January, and 5,722 tons in February, 1915. Stocks for February last were 7,342 tons, as compared with 7,351 tons in January and 7,172 tons in February, 1915.

SINGAPORE.

The effective solution of the freight situation seems to be as remote as ever. Ocean rates have advanced and may go higher. The relief promised by the government's proposed plan of commandeering the entire British tonnage is too far distant. Meanwhile shipments to the United States are being diverted by the way of Japan and the Pacific coast. Between January 6 and

February 1, 4,400 tons were shipped from Singapore by this route.

We are advised by cable that 955 tons of rubber were sold at the Singapore auctions on March 9, 16 and 23. Average price obtained for Pale crépe was 78 cents and for Smoked sheet 80 cents. Market steady and prices firm.

CEYLON.

During the period of February 17 to February 26, 7,822,641 pounds of rubber were exported, against 5,297,000 pounds in the same period of 1915, an increase of 2,525,641 pounds.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and March 30, the current date:

	April 1, '15.	March 1, '16.	March 30, '16.
UPRIVER, fine, new.....	58 @	77 @ 78	74 @ 74½
UPRIVER, fine, new.....	59 @ 60	72 @	70 @
Islands, fine, new.....	53 @	70 @ 71	70 @
Islands, fine, old.....	46 @	59 @ 60	57½ @
UPRIVER, coarse, new.....	46 @	59 @ 60	57½ @
UPRIVER, coarse, old.....	46 @	59 @ 60	57½ @
Islands, coarse, new.....	30 @	37 @	38 @
Islands, coarse, old.....	30 @	37 @	38 @
Cameta.....	34 @	40 @ 41	40 @
Cauchó, ball, upper.....	47 @	61 @ 62	59 @ 42
Cauchó, ball, lower.....	44 @	58 @	55 @
PLANTATION HEVEA.			
ribbed.....	1 Spot. 65 @	1 Spot. 92 @ 93	87½ @
	(Afloat 62 @)	Apr.-June 92 @ 93½	
		July-Dec. 89 @	84 @
First latex crepe.....	1 Spot. 62 @	1 Spot. 93 @ 94	88 @
	(Afloat 61 @)	Apr.-June 93 @ 94½	
		July-Dec. 90 @	84 @ 85
Fine sheets and biscuits,			
unsmoked.....		Spot 91 @	82 @
CENTRALS.			
Corinto.....	46 @ 47	57 @ 59	58 @
Emeralda, sausage.....	46 @	57 @ 59	58 @
Nicaragua, scrap.....	43 @ 44	56 @ 57	57 @
Mexican plantation, sheet.....	53 @	60 @	
Mexican, scrap.....	53 @	60 @	
Mexican, slab.....	38 @ 40	41 @	
Manitoba.....	37½ @	50 @ 51½	48 @ 50
Mangalora, sheet.....	40 @	42 @ 45	40 @
Guayule.....	48 @	66 @	70 @ 71
Balata, sheet.....	48 @	66 @ 67	70 @ 71
Balata, block.....	45 @	46 @	44 @ 58
AFRICAN.			
Lopori, ball, prime.....	59 @		75 @
Lopori, ball, red.....	62 @		65 @
Upper Congo, ball, red.....	72 @ 73		73 @
Rio Nuni, Niggers.....	72 @ 73		73 @
Conakry Niggers.....	72 @ 73		73 @
Mossi, red.....	54 @		72 @
Soudan, Niggers.....	37 @ 40		46 @
Cameroon, ball, soft.....	50 @		50 @
Benuea, No. 1.....	36 @ 48		46 @
Benuea, No. 2.....	38 @ 40		41 @
EAST INDIAN.			
Assam.....	58 @	10½ @	55 @
Patana.....	10 @	10½ @	10½ @
Gutta Nial.....	15 @ 16½		16 @
Gutta red Nial.....	27½ @		27 @
Borneo III.....	15 @		15 @
Gutta Percha.....	1.50	2.00	1.50 2.00

RUBBER AFLOAT TO THE UNITED STATES.

	PLANTATION.	
	FROM PENANG.	
Steamship.	Cleared.	To. Pounds.
Ping Suey.....	Jan. 15, 1916.....	*New York..... 11,200
Ping Suey.....	Jan. 15, 1916.....	Akron..... 61,600
Tosa Maru.....	Jan. 18, 1916.....	Seattle..... 2,200
Benalder.....	Jan. 25, 1916.....	*New York..... 62,666
Benalder.....	Jan. 25, 1916.....	Seattle..... 106,666
Benalder.....	Jan. 25, 1916.....	Akron..... 51,466
Benalder.....	Jan. 25, 1916.....	*San Francisco..... 10,000
Namor.....	Jan. 27, 1916.....	*New York..... 18,133
Namor.....	Jan. 27, 1916.....	Seattle..... 3,066
Hakata Maru.....	Jan. 28, 1916.....	*New York..... 28,266
Hakata Maru.....	Jan. 28, 1916.....	Seattle..... 17,600

Totals from Penang..... 310,263

	FROM SINGAPORE.	
Surusu.....	Jan. 6, 1916.....	Boston..... 6,666
Surusu.....	Jan. 6, 1916.....	New York..... 1,795,300
Hai Yang.....	Jan. 12, 1916.....	*New York..... 436,533
Hai Yang.....	Jan. 12, 1916.....	Seattle..... 285,684
Hai Yang.....	Jan. 12, 1916.....	New York..... 780,843
Knight Companion.....	Jan. 13, 1916.....	Seattle..... 571,900
Knight Companion.....	Jan. 13, 1916.....	Akron..... 278,800
Atreus.....	Jan. 15, 1916.....	*New York..... 64,800
Atreus.....	Jan. 15, 1916.....	Seattle..... 102,144

* Via Hong Kong.

Japan	Jan. 12, 1916	New York	34,000
Lat. 1st	Jan. 19, 1916	New York	28,153
Lat. 2nd	Jan. 19, 1916	New York	2,000
Lat. 3rd	Jan. 20, 1916	New York	2,000
Lat. 4th	Jan. 20, 1916	New York	25,400
Lat. 5th	Jan. 20, 1916	New York	56,000
Lat. 6th	Jan. 21, 1916	New York	24,352
Lat. 7th	Jan. 21, 1916	New York	4,600
Lat. 8th	Jan. 21, 1916	New York	116,533
Lat. 9th	Jan. 21, 1916	New York	2,100,800
Lat. 10th	Jan. 21, 1916	New York	11,333
Lat. 11th	Jan. 21, 1916	New York	28,933
Lat. 12th	Jan. 21, 1916	New York	197,800
Lat. 13th	Jan. 21, 1916	New York	11,200
Lat. 14th	Jan. 21, 1916	New York	12,400
Lat. 15th	Jan. 21, 1916	New York	164,000
Lat. 16th	Jan. 21, 1916	New York	121,333
Lat. 17th	Jan. 21, 1916	New York	120,000

Totals from Singapore 8,827,764

GUTTA JELUTONG PONTIANAK.

Sumatra	Jan. 6, 1916	Boston	112,133
Sumatra	Jan. 6, 1916	New York	258,133
Kathlamba	Jan. 27, 1916	New York	258,133

Totals from Singapore 968,799

GUTTA PERCHA.

Sumatra	Jan. 6, 1916	New York	112,000
Kathlamba	Jan. 27, 1916	Boston	22,400
Kathlamba	Jan. 27, 1916	New York	184,833
Suwa Mura	Feb. 2, 1916	New York	22,666

Totals from Singapore 361,599

BORNEO.

Sumatra	Jan. 6, 1916	New York	8,800
Kathlamba	Jan. 27, 1916	New York	11,600

Totals from Singapore 20,400

*Via Hongkong.

New York

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, New York City), advises as follows: The market for commercial paper has continued very free through March, there being a good general demand, the best rubber names selling readily at 4 per cent, and those not so well known $4\frac{1}{2}$ to $5\frac{1}{2}$ per cent, according to grade.

NEW YORK PRICES FOR MARCH.

	1916	1915	1914
Upriver fine	\$0.72 0.78	\$0.55 0.60	\$0.73 0.76
Upriver medium	50 55	45 47	43 45
Upriver fine	68 71	51 53	68 70
Upriver medium	34 39	30 32	31 33
Upriver coarse	36 40	34 35	31 33

* Figured only to March 27.

Plantation Rubber from the Far East.

TOTAL EXPORTS FROM MALAYA.

(From January 1 to 15, includes named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	Singapore.	Malacca.	Penang.	Port Swettenham.	Totals.
Great Britain	29,934,533	7,881,651	23,129,931	28,188,454	89,134,569
Continental	4,765,333	17,333	801,599	24,640	5,600,905
India	2,315,915	344 99	30 32	2,315,915	2,315,915
Ceylon	338,450	516,666	1,572,215	2,427,331	5,454,662
United States	372,459	418,400	52,454	52,454	955,767
Australia	372,459	418,400	52,454	52,454	955,767
Totals, 1915	86,067,657	7,898,984	28,580,663	29,785,309	152,332,613
Totals, 1914	43,334,177	5,318,379	21,912,567	11,386,389	81,951,512
Totals, 1913	27,857,983	3,440 99	16,042,267	28,877,774	72,778,033
Totals, 1912	14,649,707	9,684,831	20,254,369	44,588,807	49,577,714

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to February 14, 1915 and 1916. Compiled by the Ceylon Chamber of Commerce.)

To—	1915.	1916.
Great Britain	3,494,859	2,096,550
Canada and Newfoundland	340,110	—
Russia	94,719	18,695
France	358,400	—
Japan	21,686	56,576
Australia	174,100	3,600,537
United States	—	—
Totals	4,004,315	5,462,358

(Same period 1914, 3,623,565 pounds; same period, 1913, 1,839,521.) The export figures of rubber shown in the above table for 1914 include the imports

re-exported. (The amount to \$41,630 pounds.) To arrive at the total quantity of Ceylon rubber exported for that period, deduct these imports from the total export. The figures for 1915 and 1916 are for Ceylon rubber only.

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram from Kuala Lumpur gives the export of plantation rubber from the Federated Malay States for the month of February at 5,207 tons. This is the highest amount exported in one month from these States, and compares with 4,471 tons in January, and 3,411 tons in the corresponding month last year. Appended are the comparative statistics for three years:

	1914.	1915.	1916.
January	4,471	3,473	4,425
February	2,354	3,411	5,207
Totals	4,400	6,884	9,632

SINGAPORE.

Guthrie & Co., Limited report [February 9, 1916]:

The rubber catalogued for today's auction met with a good inquiry and of 298 tons offered 270 tons changed hands.

Demand throughout was good and all prices show substantial improvements.

Fine ribbed smoked sheet sold up to \$174, an increase of \$19, while fine crepe at \$172 showed an advance of \$15 in the week.

Fine and good brown crépes were wanted and for most of them were keen competition.

The following was the course of values:

	In Singapore.	Sterling equivalent per pound in London.	Equivalent per ton in London.
Sheet, fine ribbed smoked	\$165@174	3 1/4 @ 3 3/4	76.27@80.07
Sheet, fine ribbed smoked	160@165	3 0/4 @ 3 1/4	74.24@76.27
Sheet, plain smoked	161@166	3 0/4 @ 3 1/4	74.50@76.27
Sheet, ribbed, unsmoked	159@167	3 0/4 @ 3 1/4	73.73@77.03
Sheet, plain, unsmoked	157@166	2 9/4 @ 3 1/4	68.66@76.27
Crépe, fine pale	169@172	3 1/4 @ 3 3/4	78.04@79.31
Crépe, fine brown	163@169	3 1/4 @ 3 3/4	75.51@78.04
Crépe, dark brown	158@167	3 0/4 @ 3 1/4	73.33@77.03
Crépe, good brown	153@160	3 1/4 @ 3 3/4	71.20@74.24
Crépe, dark	147@154	2 9/4 @ 3 0/4	68.66@71.21
Crépe, bank	138@152	3 3/4 @ 3 7/8	65.12@70.69
Scrap, virgin	117@118	2 3/4 @ 2 3/4	55.49@56.25
Scrap, pressed	113@114	2 1/4 @ 2 1/4	64.36@64.36
Scrap, house	94@133	1 1/4 @ 2 1/4	46.12@62.58

* Piel = 133 1/3 pounds.

4 Figured at standard rate of exchange, 1 = 24.3 cents.

Quoted in S. S. dollars = 2/4 (56 cents).

MARKET CABLE SERVICE FROM SINGAPORE.

The following reports of the weekly auctions held at Singapore have been cabled by the Waterhouse Co., Ltd.:

Date.	Crépe.	Smoked Sheet.	Total Pounds.	Market.
Mar. 9, cents	78.5	78.5	851,200	Prepared for an advance.
Mar. 16, cents	79.3	78.5	804,000	Steady—improved demand.
Mar. 23, cents	77.7	77.7	504,000	Weak—no demand.

STRAITS SETTLEMENTS RUBBER EXPORTS.

The Colonial Secretary cables from Singapore that the export of plantation rubber from Straits Settlements ports for the month of February amounted to 3,359 tons compared with 4,443 tons in January and 2,741 tons in the corresponding month last year. Appended is a comparison of the statistics for three years:

	1914.	1915.	1916.
January	4,443	2,576	4,443
February	2,741	2,741	3,359
Totals	7,184	5,317	7,802

These figures include transshipments of rubber from various places in the neighborhood of the Straits Settlements such as Borneo, Java, Sumatra and the non-Federated Malay States as well as rubber actually exported from the Colony, but do not include rubber exports from the Federated Malay States.

RUBBER AND GUTTA EXPORTS FROM JAVA AND MAURA.

	November.	Eleven months ending November 30.	Twelve months ending November 30.
	1914.	1915.	1916.
Pounds.	Pounds.	Pounds.	Pounds.
From Java	2,640	3,494	42,247
From Maura	1,000	235,400	2,283,600
From Ceylon	—	—	499,400
From Ceylon (Ceylon)	—	—	134,275
From Ceylon (Ceylon)	—	—	51,630
Totals	7,040	239,444	3,011,152
From Java	2,640	2,706	41,780
From Maura	508,200	270,600	3,709,200
From Ceylon	1,765	29,819	29,819
From Ceylon (Ceylon)	4,312	28,848	27,914
Totals	514,477	275,154	3,808,713
From Java	—	—	462,000
From Maura	—	—	547,800
From Ceylon	—	—	48,262
From Ceylon (Ceylon)	—	—	6,600
From Ceylon (Ceylon)	—	—	11,000
From Ceylon (Ceylon)	—	—	162,800
From Ceylon (Ceylon)	—	—	6,547,200
Totals	28,600	543,160	162,800
From Java	—	—	4,160
From Maura	—	—	12,852
From Ceylon	—	—	79,300

	Castilla		2,735	
Totals			81,935	
Singapore	Fiens	1,133	6,215	20,266
	Manila (Ceara)	8,800	129,800	202,400
	Castilla	1,841	5,702	260
			1,811	9,002
Totals	11,744	141,717	207,558	768,468
Australia	Manihot (Ceara)			282
	Castilla			317
Totals				599
Japan	Hevea	26,400		344,300
Other countries	Hevea	2,002	249	140,800
		17,600	249	143,002
Totals		17,600	249	143,002
Grand Total	561,861	1,243,475	7,827,269	14,933,112

GUATEMALA, TO				
Singapore	111,419	35,860	1,294,740	656,885
Manihot (Ceara)				
Singapore				1,584
Australia				24,200
Totals				24,200

Crude Rubber Arrivals at the Port of New York

(The Figures Indicate Weights in Pounds.)

FEBRUARY 21.—By the steamer Gregory from Iquitos:

	Fine	Medium	Coarse	Canebo.	Total.
Meyer & Brown			28,600		28,600
H. C. Kupper	66,400	16,800	21,900		105,100
Chartered Bank of Spanish America	19,300	5,100	39,800		64,200
G. Amisnick & Co.	7,700	4,600	17,600		29,900
T. T. Johnstone & Co.	13,300	5,000	10,400		19,700
W. R. Grace & Co.	1,300	8,000	10,300		19,300
H. A. Astlett & Co.	3,000	2,800	5,800		8,600
Toledano Exporting Co.		2,600	1,500		7,100
Totals	111,000	42,700	126,800		280,500

FEBRUARY 21.—By the steamer Gregory from Pará, Manóas:

Meyer & Brown	41,800	27,700			121,800
Robinson & Co.	184,300	25,100	43,500		253,900
Henderson & Korn	25,700	14,600	25,000		65,300
Arnold & Zeiss	47,900	4,300	6,600		58,700
H. A. Astlett & Co.	6,600	1,100	47,500		55,200

	Fine	Medium	Coarse	Canebo.	Total.
G. Amisnick & Co.	28,400	4,700	14,200		47,300
Paul Bertuch	10,000	1,100	22,000		33,100
F. B. Ross	14,800	300	1,500		16,600
Cowdrey & Co.	22,600	400	1,500		24,500
Alden's Successors, Ltd.		11,400	6,900		18,300
Totals	359,700	62,500	248,100		670,300

MARCH 2.—By the steamer Acre from Pará:

Meyer & Brown	39,600	3,200	69,500		72,800
Arnold & Zeiss	84,100	23,300	69,500		197,900
G. Amisnick & Co.	68,000	4,100	22,800		94,900
Alden's Successors, Ltd.		6,250	21,800		28,050
W. R. Grace & Co.		700	8,100		8,800
H. A. Astlett & Co.	13,700	1,800	11,500		27,000
General Rubber Co.			24,000		24,000
Paul Bertuch			1,600		1,600
Muller, Schall & Co.	3,200		1,600		4,800
Totals	242,300	39,350	189,980		521,330

MARCH 3.—By the steamer Denis from Pará, Manóas:

Meyer & Brown	113,500	20,900	91,400		225,800
G. Amisnick & Co.	107,500	27,500	79,900		214,900
Henderson & Korn	95,100	39,500	91,000		225,600
General Rubber Co.	188,300	2,700	54,000		245,000
Arnold & Zeiss	68,100	10,500	76,300		154,900
Robinson & Co.	117,200	4,400	11,900		133,500
H. A. Astlett & Co.	85,500	20,300	32,300		138,100
Paul Bertuch			8,100		8,100
Alden's Successors, Ltd.		3,800	9,800		13,600
W. R. Grace & Co.		23,800	5,100		28,900
Pell & Dumont			10,600		10,600
Cowdrey & Co.			4,800		4,800
Hagenmeyer & Baum	1,900	100	1,300		3,200
Totals	990,600	141,570	468,100		1,599,270

MARCH 15.—By the steamer Atahualpa from Pará, Manóas:

Meyer & Brown	1,900	800	3,500		6,200
Arnold & Zeiss	141,700	700	44,700		187,100
Paul Bertuch	330,500				330,500
Robinson & Co.	167,900	23,400	9,700		201,000
Henderson & Korn	74,800	3,800	45,900		124,500
G. Amisnick & Co.	92,400	11,900	25,100		129,400
H. A. Astlett & Co.	96,400	33,600	22,000		152,000
W. R. Grace & Co.	26,400	5,400	8,100		39,900
Cowdrey & Co.	5,700	1,500	1,900		9,100
Alden's Successors, Ltd.	1,500	61,500	1,180		64,180
Totals	838,900	107,500	157,880		1,104,280

PARAS.

POUNDS.

FEBRUARY 28.—By the Ancon=Colon:		
W. R. Grace & Co. (Fine)	1,400	
FEBRUARY 28.—By the Byron=Rio de Janeiro:		
Rubber & Guayule Agency, Inc. (Fine)	3,000	
MARCH 2.—By the Colon=Colon:		
G. Amisnick & Co. (Fine)	9,500	
G. Amisnick & Co. (Caucho)	11,000	
Gravenhorst & Co. (Fine)	16,000	
Gravenhorst & Co. (Caucho)	1,800	38,300
MARCH 16.—By the Panama=Colon:		
G. Amisnick & Co. (Fine)	20,500	
G. Amisnick & Co. (Coarse)	2,700	
Neuss, Hessein & Co. (Fine)	1,000	24,300

CENTRALS.

(*This sign, in connection with imports of Centrals, denotes Guayule rubber.)

FEBRUARY 19.—By the Almirante=Cartagena:		
Andean Trading Co.	3,500	
Caballero & Blanco	1,500	5,000
FEBRUARY 21.—By the Tivier=Cortez:		
Eggers & Henkle	100	700
G. Amisnick & Co.	100	
FEBRUARY 21.—By the Pastores=Port Limon:		
Isaac Branden & Bros.	2,000	
A. A. Linde & Co.	500	
C. E. Griffin	800	3,300
FEBRUARY 23.—By the Neches=Galveston:		
Various		*33,500

FEBRUARY 23.—By the Monterey=Mexico:		
G. Schumann & Co.	4,000	
G. Amisnick & Co.	2,500	6,000

FEBRUARY 24.—By the Ithaca=Colon:		
G. Amisnick & Co.	32,400	
Lawrence Johnson & Co.	16,800	
Pablo, Calvet & Co.	12,000	
Muller, Schall & Co.	3,000	
W. R. Grace & Co.	2,400	
American Trading Co.	2,400	
Demarest Bros.	500	
C. E. Griffin	500	
Fidrique Bros.	500	
W. R. Grace & Co.	500	
H. Mann & Co.	500	
Commercial Bank Spanish Amer	500	
Gontard & Co.	100	71,700

POUNDS.

FEBRUARY 24.—By the Zarapa=Cartagena:

A. Held	2,500	
H. Wolff & Co.	500	3,000

FEBRUARY 28.—By the Calamag=Port Limon:

Szozate & Whitney	3,500	
H. Manzanilla & Co.	200	
United Fruit Co.	4,000	4,700

MARCH 2.—By the Colon=Colon:

G. Amisnick & Co.	3,300	
A. M. Capen's Sons	4,500	
Meeke & Co.	4,200	
Pablo, Calvet & Co.	8,000	
L. S. Sembrado & Co.	1,700	
Pottberg, Ebeling & Co.	2,500	30,300
Piza, Nephews & Co.	6,000	

MARCH 3.—By the Carrillo=Colon:

G. Amisnick & Co.	5,500	
A. Held	3,000	
American Trading Co.	2,000	
Pottberg, Ebeling & Co.	500	11,000

MARCH 6.—By the Esperanza=Mexico:

Graham, Hunkley & Co.	2,500	
American Trading Co.	4,000	
G. Amisnick & Co.	700	
General Export & Commission Co.	500	
H. Marguardt & Co., Inc.	500	
G. A. Medina & Co.	200	
Thurston & Braich	200	
Various	5,000	13,500

MARCH 7.—By the Siroa=Puerto Barrios:

W. R. Grace & Co.	3,000	
Rosenblatt & Sons	3,000	5,000

MARCH 7.—By the Tenadores=Port Limon:

Isaac Branden & Bros.	3,000	
G. Amisnick & Co.	1,000	
A. A. Linde & Co.	1,000	
H. Mann & Co.	500	5,500

MARCH 9.—By the El Mundo=Galveston:

Various		*2,500
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MARCH 10.—By the Idarosa=Colon:

Harburger & Stack	700	
G. Amisnick & Co.	400	
Pottberg, Ebeling & Co.	400	1,300

MARCH 14.—By the Metapan=Port Limon:

Isaac Branden & Bros.	1,500	
United Fruit Co.	1,300	
Kunhardt & Co.	500	
C. E. Griffin	500	3,700

POUNDS.

MARCH 15.—By the El Sol=Galveston:

Various		*17,000
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MARCH 16.—By the Panama=Colon:

Gravenhorst & Co.	1,000	
Andean Trading Co.	5,500	
Muller, Schall & Co.	1,400	7,900

MARCH 17.—By the Camaguey=Mexico:

Harburger & Stack	3,000	
H. Marguardt & Co., Inc.	200	3,200

MARCH 17.—By the Almirante=Cartagena:

G. Amisnick & Co.	3,500	
H. Wolff & Co.	3,500	
Andean Trading Co.	2,500	
Caballero & Blanco	2,500	12,000

MARCH 20.—By the Cristobal=Colon:

G. Amisnick & Co.	10,100	
H. Mann & Co.	1,400	
Harburger & Stack	300	
Gontard & Co.	700	
Meyer Hecht	200	
Various	400	13,300

AFRICANS.

FEBRUARY 19.—By the Ben Nevis=Havre:

Various		67,000
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FEBRUARY 21.—By the Guyane=Bordeaux:

Various		33,600
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FEBRUARY 21.—By the Finland=Helsinki:

Charles T. Wilson Co., Inc.	45,000	
Edward Maurer Co., Inc.	17,000	
Various	6,000	68,000

FEBRUARY 23.—By the New York=Liverpool:

Alden's Successors, Ltd.		150,000
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FEBRUARY 26.—By the Roma=Lisbon:

W. H. Stiles	22,500	
Edward Maurer Co., Inc.	22,500	
S. R. Sequeira	4,500	49,500

FEBRUARY 29.—By the California=Havre:

Robert Badenhop Co.		33,600
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MARCH 1.—By the Lepanto=Hull:

Alden's Successors, Ltd.		22,500
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MARCH 3.—By the Atlas=Lisbon:

W. H. Stiles		45,000
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	Pounds.
MAR 10.—By the <i>Anglo Bolivian</i> =London:	33,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	11,200
MAR 10.—By the <i>Anglo Bolivian</i> =London:	4,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	11,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	11,200
MAR 10.—By the <i>Anglo Bolivian</i> =London:	25,200
MAR 10.—By the <i>Anglo Bolivian</i> =London:	33,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	73,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	11,200
MAR 10.—By the <i>Anglo Bolivian</i> =London:	11,200
MAR 10.—By the <i>Anglo Bolivian</i> =London:	15,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	86,200
MAR 10.—By the <i>Anglo Bolivian</i> =London:	75,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	40,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	18,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	11,200
MAR 10.—By the <i>Anglo Bolivian</i> =London:	56,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	22,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	13,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	33,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	28,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	5,600
MAR 10.—By the <i>Anglo Bolivian</i> =London:	20,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	93,800

MANICOBIA.

FEBRUARY 23.—By the <i>Stephen</i> =Batavia:	40,000
FEBRUARY 23.—By the <i>Stephen</i> =Batavia:	49,000
FEBRUARY 23.—By the <i>Stephen</i> =Batavia:	53,500

PLANTATION RUBBER.

FEBRUARY 17.—By the <i>Mangrove</i> =London:	2,400
FEBRUARY 17.—By the <i>Mangrove</i> =London:	22,500
FEBRUARY 17.—By the <i>Mangrove</i> =London:	38,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	370,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	20,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	212,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	70,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	55,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	22,500
FEBRUARY 23.—By the <i>Mangrove</i> =London:	59,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	1,038,500
FEBRUARY 23.—By the <i>Mangrove</i> =London:	11,200
FEBRUARY 23.—By the <i>Mangrove</i> =London:	27,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	140,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	235,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	20,500
FEBRUARY 23.—By the <i>Mangrove</i> =London:	57,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	100,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	50,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	50,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	45,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	190,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	14,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	95,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	60,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	1,053,500
FEBRUARY 23.—By the <i>Mangrove</i> =London:	12,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	22,500
FEBRUARY 23.—By the <i>Mangrove</i> =London:	45,000
FEBRUARY 23.—By the <i>Mangrove</i> =London:	56,000

	Pounds.
MAR 10.—By the <i>Anglo Bolivian</i> =London:	11,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	50,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	112,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	34,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	35,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	65,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	47,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	40,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	554,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	270,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	505,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	50,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	100,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	100,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	104,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	15,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	431,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	180,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	50,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	104,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	120,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	156,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	20,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	1,139,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	22,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	225,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	135,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	120,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	32,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	50,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	653,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	120,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	45,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	11,200
MAR 10.—By the <i>Anglo Bolivian</i> =London:	4,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	322,700
MAR 10.—By the <i>Anglo Bolivian</i> =London:	130,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	140,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	165,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	40,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	60,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	17,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	32,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	7,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	15,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	24,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	300,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	45,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	117,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	70,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	1,308,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	27,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	80,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	160,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	45,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	140,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	28,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	40,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	34,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	3,500
MAR 10.—By the <i>Anglo Bolivian</i> =London:	6,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	14,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	250,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	50,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	785,000
MAR 10.—By the <i>Anglo Bolivian</i> =London:	75,000

	Pounds.
General Rubber Co.	70,000
Robert Badenhop Co., Inc.	6,000
H. R. Jeffords	11,200
Robinson & Co.	2,000
Rumsey & Greutert Co., Inc.	40,000
F. Stern & Co.	7,000
Hood Rubber Co.	1,120
Alden's Successors, Ltd.	110,000
Fox & Co.	175,000
J. T. Johnstone & Co.	20,000
Goodyear Tire & Rubber Co.	1,858,520
Rubber Trading Co.	17,000
MAR 20.—By the <i>Orduna</i> =Liverpool:	4,000
The B. F. Goodrich Co.	21,000

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK—JANUARY, 1916.

	Pounds.	Value.
Imports:		
India rubber	19,435,241	\$11,309,720
Gutta percha	261,764	\$6,437
Gutta jelutong (Pontianak)	136,936	14,786
Rubber scrap	1,333,876	\$6,710
Rubber scrap imported	640,336	\$4,848
Totals	21,825,705	\$11,529,071

	Pounds.	Value.
Exports:		
Rubber scrap	7,947	\$2,982
Totals	275,811	\$32,968
Totals	333,326	\$38,950

PORT OF NEW ORLEANS—JANUARY, 1916.

	Pounds.	Value.
Imports:		
India rubber	29,100	\$15,592

PORT OF SAN FRANCISCO—JANUARY, 1916.

	Pounds.	Value.
Imports:		
India rubber	235,076	\$141,403
Gutta percha	22,471	1,741
Totals	257,547	\$143,144

PORT OF BOSTON—FEBRUARY, 1916.

	Pounds.	Value.
Imports:		
India rubber	53,004	\$36,064
Gutta percha	78,866	7,351
Gutta jelutong (Pontianak)	315,600	14,612
Manufactures of india rubber	—	4,851
Rubber scrap	—	782
Totals	455,520	\$60,560

PORT OF CHICAGO—FEBRUARY, 1916.

	Pounds.	Value.
Imports:		
Manufactures of india rubber	48,546	\$800
Rubber scrap	—	2,314
Totals	48,546	\$3,314

PORT OF CLEVELAND—FEBRUARY, 1916.

	Pounds.	Value.
Imports:		
India rubber	659,337	\$475,892

PORT OF DETROIT—FEBRUARY, 1916.

	Pounds.	Value.
Imports:		
Rubber scrap	3,247	\$130

PORT OF NEW ORLEANS—FEBRUARY, 1916.

	Pounds.	Value.
Imports:		
India rubber	292,847	\$124,444

PORT OF NEWARK—JANUARY, 1916.

	Pounds.	Value.
Imports:		
Manufactures of india rubber	—	\$348
Rubber scrap	—	4,125
Totals	61,761	\$4,473

EXPORTS.

	Pounds.	Value.
Exports:		
India rubber	111,257	\$72,638
Reclaimed rubber	83,230	10,745
Rubber scrap	18,648	1,282
Totals	213,135	\$84,665

PORT OF PHILADELPHIA—FEBRUARY, 1916.

	Pounds.	Value.
Imports:		
Rubber scrap	24,886	\$7,080
Belted base, etc.	—	1,738
All other manufactures of india rubber	—	6,373
Totals	24,886	\$15,191

IMPORTS AND EXPORTS OF RUBBER AND RUBBER MANUFACTURES AT THE PORT OF NEW YORK.

IMPORTS AND EXPORTS OF RUBBER AND RUBBER MANUFACTURES AT THE PORT OF NEW YORK.										
IMPORTS.										
	India Rubber.		Scrap for re-manufacture.		Butadiene.		Chicle.		Gutta Percha.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Wm. E. Foster.										
February 18, 1916.	3,407,728	1,853,518	88,940	28,430	811,211		13,352	\$4,341		\$459
February 25, 1916.	4,773,431	3,583,505	149,337	4,000	9,340		11,883	2,085		
March 3, 1916.	5,602,470	3,181								
March 10, 1916.	2,927,588	1,269,110	479,237	18,000	56,500		23,362		14,343	5,087
			310,410	8,072	23,344		827	135		

Pounds not specified.

In addition to the above, the following imports of gutta jelutong are recorded: February 18, 1916, from Straits Settlements, 70,951 pounds, value \$3,655; February 25, 1916, from Straits Settlements, 4,010 pounds, value \$5,485.

EXPORTS.

FIGURES ISSUED FROM FEBRUARY 25, 1916, TO MARCH 25, 1916.

EXPORTED TO—	Belting, Hose and Packing.	Footwear.		Tires.		Insulated Wire and Cable.	Other mfr. of India Rubber.	Fountain Pens.	Chewing Gum.	Reclaimed Rubber.	Scrap Rubber.
EUROPE:		Boots.	Shoes.	Auto.	Other.						
Denmark.....	\$343		\$354		\$1,725		\$809			\$317	
Estonia.....	4,384	\$38	3,375	\$6,516	43	\$12,393	\$1,291	\$50	\$4,625	8,180	\$1,310
Finland.....								211			
France.....						430					
Germany.....		1,136	3,917	63,436	11,438	10,063	16,836	313		409	
Italy.....	802		96	3,727	6,672	8,892	9,439				
Netherlands.....	1,790		157		5,077	23,295	461			87	
Norway.....	1,017	57		77,754			2,719	233			
Portugal.....				377,350			1,381				
Russia in Europe.....		160				2,374	5,412	732			
Spain.....				11,046			501	305			
Sweden.....	52					855	299				
Switzerland.....											
United Kingdom—											
England.....	73,100	19,933	26,977	290,021	94,121	38,20	210,466	3,425	18,440	65,035	10,659
Scotland.....	1,920		79	887			1,288			468	18,377
Totals, Europe.....	\$83,388	\$21,324	\$34,295	\$756,717	\$119,076	\$62,793	\$320,459	\$5,294	\$23,065	\$74,496	\$30,346
NORTH AMERICA:											
Bermuda.....	\$125		\$3		\$40	\$1,174	\$626	\$64	\$185		
British Honduras.....	1									\$34	
Canada.....				\$28			26		120		
Central American States—											
Costa Rica.....	740		13	450	2	38	915	177	665		
Cuba.....				505	52	327	256		125		
Honduras.....	28			609	301	3,820	144		41	86	
Nicaragua.....	54			48		513	1,519	219	47	30	
Panama.....	9,705	\$853	1,247	4,580	1,085	2,679	2,183	254	1,320		
Salvador.....	705			295	369	4,339	595		435		
Mexico.....	4,263			34,107	4,133	2,378	3,040	88			
Newfoundland and Labrador.....	1	1,457	1,903		93		156	61	224		
West Indies—											
British—											
Bahamas.....	42			760		28	187	53			
Jamaica.....	719			5,625	4,429	732	1,270		24		
Trinidad and Tobago.....	425			128	36						
Other British.....	13			210	129	38	170	12	37		
Cuba.....	12,065		36	50,311	10,655	18,369	25,736	5	748	3,230	
Danish.....	.....		11	25	5	4	41	3	28	6	
French.....	36			6	16		82	40			
Italian.....	199			32	83		245	84	12		
Haiti.....	314	17		457	589	133	748			15	
Santo Domingo.....											
Totals, North America.....	\$29,888	\$2,327	\$3,309	\$100,960	\$25,447	\$30,794	\$40,074	\$1,060	\$4,021	\$3,401	
SOUTH AMERICA:											
Argentina.....	\$1,471		\$352	\$89,507	\$4,363	\$12,860	\$21,132	\$1,427	\$8,750	\$374	
Bolivia.....	76			1,017		70					
Brazil.....	3,655	\$69		54,745	35,900	4,209	12,044	108		385	
Chile.....	8,332		1,532	4,087	3,093	6,295	5,084			5,477	
Colombia.....	250	34		2,927	46	638	794	18	22		
Ecuador.....	75			886	66		43				
Guatemala—					246						
British.....				30			218				
Peruvian.....								11		143	
Peru.....	205			487	63	207	1,757		11	38	
Uruguay.....	393		1,813	15,233		1,445	5,355				
Venezuela.....	106			14,613	1,224	1,526	1,755	16		24	
Totals, South America.....	\$16,738	\$103	\$4,170	\$193,553	\$49,534	\$27,977	\$49,635	\$1,580	\$8,783	\$6,444	
ASIA:											
China.....	\$607			\$2,768	\$100	\$939	\$705	\$2			
British East Indies—											
British India.....	.....		2,233	9,181	198	10,564	761	32	868		
British East Indies.....	.....			1,130		1,548	148				
Hongkong.....	222			2,503			755				
Japan.....	752					1,306	766			1,331	
Totals, Asia.....	\$1,954		\$371	\$15,582	\$304	\$14,251	\$3,135	\$34	\$98	\$1,331	
OCEANIA:											
British—											
Australia and Tasmania.....	.....	\$4,707	\$11,254	\$30,727	9,155	\$33,440	\$10,638		\$3,778		\$544
New Zealand.....	.....	3,279	5,584	9,485	4,213	66	7,537		2,648	6	
Philippine Islands.....	7,183			6,749	1,505	1,039	1,981	\$126	400		
Totals, Oceania.....	.....	\$7,986	\$16,838	\$124,961	\$9,873	\$4,585	\$20,146	\$126	\$6,826	\$550	
AFRICA:											
British Africa—											
West.....	.....			\$1,621			\$116				
South.....	.....		\$1,098	73,702		\$115	.....	\$154		\$67	\$787
East.....	.....			2,391		95					
French Africa.....	.....									
Portuguese Africa.....	.....						144				
Totals, Africa.....	.....	\$56	\$1,098	\$78,714	\$6,076	\$105	\$8,517	\$154	\$67	\$787	

In addition to the above the following items were exported during the same period: To England—Balata, \$49,274; to Newfoundland—Gutta Percha, \$25; to St. Pierre—Other Manufactures of India Rubber, \$16.

MONTHLY IMPORTATIONS OF RUBBER TO THE UNITED STATES FOR THE LAST SIX YEARS (IN TONS).

[From Annual Statistical Summary of Mexico & Foreign, New York.]

Time Period	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Total
1910	1,348	1,412	2,318	413	57	1,105	1,111	366	543	858	1,117	1,147	10,274
1911	1,911	1,201	1,638	38	43	1,105	1,111	366	543	858	1,117	1,147	10,274
1912	1,758	1,057	1,804	1,240	674	280	200	844	806	1,056	1,105	1,241	13,185
1913	1,354	1,580	806	246	800	446	500	500	757	877	1,120	774	10,662
1914	1,007	643	1,282	294	800	800	800	800	800	1,146	1,100	836	10,017
1915	1,313	638	1,260	418	800	200	800	458	1,243	781	1,372	1,604	11,658
Caster-Pine													
1910	657	504	842	150	3	700	700	458	386	363	386	4,622	
1911	450	469	384	30	413	700	700	458	421	400	400	5,074	
1912	557	642	500	30	400	400	400	400	400	400	400	5,155	
1913	606	605	456	400	400	400	400	400	400	400	400	5,155	
1914	400	341	754	440	500	900	400	380	364	364	418	4,853	
1915	400	482	1,047	300	500	400	400	400	400	421	725	562	6,018
Cauché													
1910	238	109	370	169	71	38	245	34	55	62	43	1,893	
1911	238	241	120	183	250	143	200	143	91	115	104	80	1,893
1912	85	333	15	391	300	176	300	176	183	221	327	2,776	
1913	70	251	185	200	244	400	237	258	140	188	169	87	3,152
1914	108	105	605	858	244	200	365	300	337	148	188	169	4,206
1915	130	203	1,111	200	250	300	400	400	275	7	329	219	4,341
Plantation Ceylon													
1910	332	170	314	248	124	284	483	317	307	416	366	3,611	
1911	332	407	616	318	200	400	400	400	614	697	531	4,007	
1912	332	800	976	900	1,200	1,200	800	900	1,100	1,100	1,100	15,003	
1913	1,611	1,558	1,928	1,504	1,000	1,700	1,728	1,700	2,214	2,214	2,373	2,708	
1914	2,165	2,782	3,329	4,407	4,400	2,403	2,204	3,000	3,360	3,327	2,133	35,326	
1915	410	3,865	5,205	7,166	4,443	6,319	5,260	5,100	5,100	5,100	5,100	7,361	61,085
Other Grades													
1910	1,706	1,240	1,741	1,131	701	603	353	1,000	643	536	717	818	12,516
1911	1,706	1,240	1,741	1,131	701	603	353	1,000	643	536	717	818	12,516
1912	1,706	1,240	1,741	1,131	701	603	353	1,000	643	536	717	818	12,516
1913	1,706	1,240	1,741	1,131	701	603	353	1,000	643	536	717	818	12,516
1914	1,706	1,240	1,741	1,131	701	603	353	1,000	643	536	717	818	12,516
1915	1,706	1,240	1,741	1,131	701	603	353	1,000	643	536	717	818	12,516

EXPORTS OF INDIA RUBBER FROM MANAOS DURING JANUARY, 1916.

EXPORTERS.	NEW YORK.				EUROPE.				Totals.	Grand Totals.
	Fine.	Medium.	Coarse.	Cauché.	Fine.	Medium.	Coarse.	Cauché.		
Suter & Co., Rio de Janeiro	42,407	2,999	14,260	28,836	93,942	25,840	3,680	36,124	39,920	133,862
Gravato & Co., Rio de Janeiro	20,542	16,843	42,495	16,553	278,433	113,253	10,647	16,124	180,264	458,697
General Rubber Co. of Brazil	103,544	22,791	25,163	25,500	176,000	86,731	14,438	18,391	150,264	311,122
Genesio & Andreoli	103,778	5,536	21,260	20,321	150,000	86,731	14,438	18,391	150,264	311,122
Adelbert H. Alden, Ltd.	14,699	20,315	5,291	40,305	38,969	7,837	800	13,683	59,286	142,815
Industria Paranaense	20,315	16,865	10,333	63,050	38,969	7,837	800	13,683	59,286	142,815
I. de Almeida	1,190	2,000	4,590	1,920	14,870	19,520	1,400	1,400	19,520	34,390
Coulinho & Co.	14,437	30	4,983	1,096	20,895	6,046	40	6,086	26,981	60,861
Amorim Irmãos	25	1,200	600	1,100	17,920	1,920	1,400	1,400	21,240	21,240
Motta & Co.	45	1,200	600	1,100	17,920	1,920	1,400	1,400	21,240	21,240
Messquita & Co.	7,040	160	600	1,100	17,920	1,920	1,400	1,400	21,240	21,240
M. Fale	7,040	160	600	1,100	17,920	1,920	1,400	1,400	21,240	21,240
Maxim Hildon	7,040	160	600	1,100	17,920	1,920	1,400	1,400	21,240	21,240
Singer & Co.	7,040	160	600	1,100	17,920	1,920	1,400	1,400	21,240	21,240
Sundries	7,040	160	600	1,100	17,920	1,920	1,400	1,400	21,240	21,240
Exports from Manaus	508,207	85,403	155,537	112,723	861,950	504,871	46,778	39,861	801,049	1,562,999
In transit, Iquitos	52,846	25,008	21,252	35,419	134,525	38,951	11,796	15,244	100,155	234,680
Totals	561,143	110,411	176,779	148,142	996,475	543,822	58,574	75,105	801,204	1,797,679

(Compiled by Suter & Co., Manaus.)

EXPORTS OF INDIA RUBBER AND CAUCHO FROM PARA AND MANAOS DURING THE MONTH OF JANUARY, 1916.

EXPORTERS.	NEW YORK.				EUROPE.				Totals.	Grand Totals.
	Fine.	Medium.	Coarse.	Cauché.	Fine.	Medium.	Coarse.	Cauché.		
J. Marques	155,692	3,357	157,081	100,647	437,777	100,647	3,357	3,357	394,848	440,826
Suter & Co.	97,072	26,771	62,734	37,240	217,217	37,240	26,771	26,771	217,217	248,485
Adelbert H. Alden, Ltd.	75,531	14,549	8,409	1,243	95,732	14,549	8,409	8,409	129,207	129,207
General Rubber Co. of Brazil	129,069	13,710	83,940	106,446	333,165	106,446	13,710	13,710	333,165	333,165
Ferre Teixeira & Co.	25,789	2,731	42,402	13,897	84,000	13,897	2,731	2,731	101,659	101,659
Zarges, Berringer & Co.	68,391	6,838	11,356	9,442	96,027	9,442	6,838	6,838	113,003	113,003
Selgmann & Co.	6,406	1,200	600	1,100	15,904	1,100	1,200	1,200	15,904	15,904
Suárez Hermanos & Co.	42,470	1,200	600	1,100	45,370	1,100	1,200	1,200	45,370	75,283
Singer & Co.	7,040	160	600	1,100	9,900	1,100	160	1,100	9,900	11,848
F. Fradelizi & Co.	7,990	310	1,000	1,100	19,780	1,100	310	1,100	21,190	21,190
Sundries	76,098	4,700	30,400	3,710	117,908	20,504	4,700	5,412	148,524	200,584
Exports from Para	684,458	87,675	441,831	330,361	1,443,305	330,361	87,675	87,675	1,551,011	1,700,438
Exports from Manaus	353,809	50,711	114,363	90,414	595,294	235,141	24,238	28,882	314,338	944,143
Totals	1,038,357	146,746	558,995	426,602	2,170,750	362,416	38,541	40,224	475,431	2,646,181

(Compiled by J. Marques, Para.)

UNITED STATES RUBBER STATISTICS FOR 1915.

ARTICLES	IMPORTS.		Totals, 1915.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—				
Rubber	257,998	\$93,747	2,302,684	\$864,694
Creosote gum	64,173	88,916	4,966,464	1,454,453
Gutta jelutong	2,506,960	104,338	21,230,028	979,786
Gutta percha	214,263	41,129	2,331,246	258,948
Totals	3,043,194	\$308,130	30,730,422	\$3,548,881
India rubber				
From France	19,854	\$10,887	290,446	\$134,073
Germany			6,987	843
Portugal	285,903	88,096	4,351,835	1,539,939
United Kingdom	7,124,800	4,418,718	87,244,979	47,566,344
Central America and British Honduras	107,616	44,392	1,243,476	\$49,101
Mexico	137,517	47,936	1,761,911	660,648
Brazil	4,807,326	2,069,467	51,473,477	21,422,230
Other South America	308,121	127,705	5,949,524	2,519,091
East Indies	11,342,768	6,038,524	63,940,104	33,712,497
Other countries	155,225	96,058	5,219,182	2,926,378
Totals	24,289,540	\$12,941,783	221,481,921	\$11,031,144
Rubber scrap	1,249,707	\$90,702	12,342,117	\$877,026
Totals, unmanufactured		\$13,340,615		\$11,545,051
Chicle (including gutta)	503,359	\$182,222	7,916,893	\$2,903,018
MANUFACTURED—(including)				
Gutta percha		\$154		\$6,266
India rubber		24,496		445,253
Totals, manufactured		\$24,650		\$451,521
Substitutes—lastings, etc.		\$2,702		\$19,334

EXPORTS—DOMESTIC MERCHANDISE.

Scrap and old rubber	291,647	\$42,788	3,117,750	\$356,350
Reclaimed rubber	516,396	70,352	6,195,164	830,863
Belting, hose and packing	297,904	2,011,556		
Rubber boots	124,972	264,904	548,466	1,228,681
Rubber shoes	146,712	77,484	2,098,531	1,475,697
Automobile tires				
To England		835,299		6,698,584
Canada		81,084		1,185,930
Mexico		19,115		182,578
Cuba		61,617		356,903
Australia		94,646		563,639
Philippine Islands		26,002		292,735
Other countries		483,927		2,165,329
Totals		\$1,601,690		\$11,415,698
All other tires		\$173,772		\$1,995,319
Footwear parts	10,063	7,115	200,261	205,640
Other rubber goods		483,474		5,100,959
Totals, manufactured		\$2,459,756		\$24,621,163

EXPORTS—FOREIGN MERCHANDISE.

UNMANUFACTURED—				
Rubber		784,360		\$307,479
Creosote gum		47,391		16,701
Gutta jelutong		2,773		303
Gutta percha	13,645	\$1,600	63,637	12,466
Chicle	155,956	95,831	4,664,095	2,337,550
Substitutes			12,687	1,107
Totals unmanufactured		\$97,431		\$2,695,408
Chicle	9,849	\$5,434	463,589	\$156,285
MANUFACTURED—				
Gutta percha				\$188
India rubber				10,708
Totals, manufactured				\$10,896
Substitutes—lastings, etc.				\$364

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

To Alaska:				
Belting, hose and packing		\$10,103		\$123,745
Automobile tires		65,103		183,347
Other rubber goods		7,726		26,377
Totals		\$22,932		\$333,469
To Hawaii:				
Belting, hose and packing		\$11,555		\$78,087
Automobile tires		43,097		447,469
Other tires		7,973		58,368
Other rubber goods		70,096		70,096
Totals		\$70,721		\$654,020

ARTICLES	December, 1915.		Totals, 1915.	
	Pounds.	Value.	Pounds.	Value.
To Philippine Islands:				
Belting, hose and packing		\$2,505		\$50,765
Boots and shoes	984	854	37,412	34,489
Tires		3,726		363,657
Other rubber goods		29,552		151,799
Totals		\$36,637		\$600,710
To Porto Rico:				
Belting, hose and packing		\$3,551		\$34,676
Automobile tires		32,799		313,429
Other tires		9		27,326
Other rubber goods		5,562		66,097
Totals		\$41,921		\$441,528

UNITED KINGDOM RUBBER STATISTICS FOR MONTH ENDING FEBRUARY 29, 1916.

ARTICLES	February, 1916.		Two Months Ending February 29, 1916.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—				
Crude rubber:				
From Dutch East Indies	441,600	\$324,065	1,014,600	\$758,933
French West Africa	40,000	34,873	187,000	98,323
Gold Coast	100,500	40,377	178,800	71,807
Other countries in Africa	855,900	459,873	1,382,800	709,118
Peru	27,800	193,263	554,300	393,961
Brazil	3,383,600	1,681,720	4,176,200	3,108,576
British India	134,700	84,608	652,500	521,604
Straits Settlements, including Labuan	3,263,700	2,395,849	8,325,200	6,358,197
Federated Malay States	1,096,600	826,705	4,231,200	3,289,510
Ceylon and depend.	1,578,800	1,222,484	4,013,300	3,156,215
Other countries	135,200	84,831	349,400	356,895
Totals	10,287,400	\$7,318,648	25,067,200	\$18,723,548
Waste and reclaimed rubber	60,100	\$36,682	1,099,000	\$138,515
Gutta percha	556,600	254,513	1,334,000	540,655
MANUFACTURED—				
Apparel, waterproofed		\$2,321		\$8,938
Boots and shoes—open pairs	24,284	185,467	43,286	400,814
Insulated wire		73,736		86,975
Submarine cable		3,154		30,292
Automobile tires and tubes		1,093,758		2,513,354
Motorcycle tires and tubes		1,938		65,527
Cycle tires and tubes		21,797		108,359
Tires not specified		8,918		12,306
Totals		\$2,321		\$8,938
Exports				
February, 1916.			February 29, 1916.	
Apparel, waterproofed				
To France		\$29,466		\$65,318
British South Africa		10,362		20,908
British East Indies		3,154		6,614
Australia		33,344		55,010
New Zealand		15,197		45,577
Canada		13,020		24,334
Other countries		67,583		132,051
Totals		\$172,126		\$349,812
Boots and shoes—open pairs	4,919	\$28,413	14,648	\$75,889
Insulated wire		154,713		342,588
Submarine cable		31,920		125,359
Automobile tires and tubes		379,439		7,021
Motorcycle tires and tubes		35,711		60,517
Cycle tires and tubes		229,071		492,843
Tires not specified		75,578		134,870
Manufactures not specified		438,328		1,059,864

EXPORTS—FOREIGN AND COLONIAL.

ARTICLES	February, 1916.		Two Months Ending February 29, 1916.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—				
Crude rubber:				
To Russia	1,027,600	\$582,801	1,532,100	\$948,155
France	1,893,900	1,555,730	3,443,200	2,701,319
United States	5,666,900	4,177,262	10,540,100	7,708,038
Other countries	1,335,000	909,350	3,013,200	2,037,346
Totals	9,923,400	\$7,225,143	18,518,700	\$13,394,858
Waste and reclaimed rubber	31,900	\$5,832	58,600	\$9,905
Gutta percha	67,800	43,351	119,200	72,963
MANUFACTURED—				
Apparel, waterproofed		\$39		\$102
Boots and shoes—open pairs		12,675	6,842	40,126
Insulated wire		11,299		16,393
Automobile tires and tubes		31,794		677,562
Motorcycle tires and tubes		5,965		7,021
Cycle tires and tubes		52,094		55,511
Tires not specified		126		977

RUBBER STATISTICS FOR CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	December, 1915.		Nine Months Ending December, 1915.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED TREE				
Rubber and gutta percha, crude, containing in india rubber:				
From Great Britain	36,146	\$212,462	3,692,963	\$1,966,778
United States	186,571	110,274	2,908,768	1,511,643
British Settlements			2,254	11,599
Other countries			196,778	93,579
Totals	551,017	\$326,236	6,911,085	\$3,603,656
Rubber, re-covered:				
From Great Britain	298,220	\$40,958	3,371,971	\$2,482
United States				426,005
Totals	298,220	\$40,958	3,376,363	\$248,487
Hard rubber, in sheets and rods:				
From Great Britain	3,340	\$1,435	2,234	\$1,340
United States	32,982	3,480	126,603	14,467
Totals	35,122	\$4,815	128,847	\$15,807
Rubber substitute:				
From Great Britain			16,644	\$1,812
United States	90,708	\$9,279	389,776	\$1,134
Totals	90,708	\$9,279	406,420	\$32,946
Rubber, powdered, and rubber in gutta percha waste:				
From Great Britain			7,114	\$379
United States	3,654	\$2,472	860,704	\$5,386
Other countries			12,394	534
Totals	3,654	\$2,472	880,412	\$54,501
Rubber thread, not covered:				
From United States	3,883	\$5,261	3,316	\$31,912
Latex, crude:				
From United States			1,644	\$991
Chicle, crude:				
From Great Britain			2,888	\$1,675
United States	48,000	\$17,800	230,971	\$9,557
British Honduras	45,089	16,951	832,997	\$66,373
Mexico	31,382	10,153	216,480	79,890
Totals	125,376	\$44,904	1,283,336	\$477,695
	December, 1915.		Nine Months Ending December, 1915.	
	General Tariff Value.	Preferential Tariff Value.	General Tariff Value.	Preferential Tariff Value.
MANUFACTURED, DUTYABLE				
Waterproof clothing:				
From Great Britain	\$9,440	\$3,454	\$274,885	
United States	\$5,118	80,098		
Other countries	42	63		
Totals	\$5,160	\$9,440	\$83,615	\$274,885
Hose, lined with rubber:				
From Great Britain		\$31		\$420
United States	\$4,145		\$54,074	
Totals	\$4,145	\$31	\$54,074	\$420
Mats and mattresses:				
From Great Britain		\$36		\$131
United States	\$83		\$1,013	
Totals	\$83	\$36	\$1,013	\$131
Packings:				
From Great Britain			\$110	\$1,153
United States	\$2,601		36,293	
Totals	\$2,601		\$36,903	\$1,153
Tires of rubber for all vehicles:				
From Great Britain	\$4,110	\$948	\$14,102	\$21,907
United States	51,575		1,039,283	
France	818		19,437	
Other countries	2		1,132	
Totals	\$56,505	\$948	\$1,071,354	\$21,907
*Rubber cement and all manufactures of india rubber and gutta percha, N. O. P.:				
From Great Britain	\$117	\$8,303	\$2,485	\$120,086
United States	47,950		425,800	
Other countries	1		688	
Totals	\$48,057	\$8,303	\$428,120	\$120,086
Hard rubber in tubes:				
From United States	\$392		\$2,913	
Boots and shoes:				
From Great Britain				\$11,546
United States	\$8,829		\$67,413	
Other countries			10	
Totals	\$8,829		\$67,423	\$11,546
Beltting:				
From Great Britain				\$1,053
United States	\$4,194		\$89,127	
Totals	\$4,194		\$39,127	\$1,053

Webbing—same as india rubber.

	From Great Britain	United States	Other countries	Total
	3,692,963	2,908,768	2,254	\$3,603,656
	\$1,966,778	\$1,511,643	\$11,599	\$3,489,020

*In addition, the imports of rubber cement and all manufactures of india rubber and gutta percha not otherwise provided for amounted to \$260 from various countries for December; and \$307 from Great Britain, and \$1795 from other countries for the nine months ending December, 1915, the values being at treaty rates.

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS

	December, 1915.		Nine Months Ending December, 1915.	
	Product Value.	Re-exported to foreign goods Value.	Product Value.	Re-exported to foreign goods Value.
MANUFACTURED, DUTYABLE				
Beltting:				
To Great Britain	\$150		\$150	
United States			474	\$58
Newfoundland			11	
Other countries			32	
Totals	\$150		\$719	\$58
Hose:				
To Great Britain			\$11,608	
United States	\$145		3,966	\$301
Newfoundland	140		2,966	
Other countries			1,200	
Totals	\$145		\$16,734	\$301
Boots and shoes:				
To Great Britain	\$158,923		\$417,308	
United States			531	\$492
Newfoundland	13,693		6,759	
Australia	304		24,317	
Other countries	4,636		19,194	327
Totals	\$177,556		\$487,109	\$819
Mats and matting:				
To various countries	\$15		\$433	
Clothing:				
To Great Britain			\$7	\$10
United States			59	\$62
Newfoundland			140	
Other countries			62	
Totals			\$268	\$212
*Rubber waste:				
To United States	\$54,787		\$412,894	\$1,964
All other nat., N. O. P.				
To Great Britain	\$113,088	\$1,717	\$639,864	\$2,671
United States	7,435	5,994	80,851	275,118
Newfoundland	1,071		4,797	788
Australia	1,611		4,576	
Other countries	10,225		77,274	16
Totals	\$133,031	\$7,711	\$872,133	\$279,584
Gum chicle:				
To Great Britain			\$10,000	
United States	\$52,500	\$5,442	\$30,203	\$111,840
Other countries			42,216	1,107
Totals	\$52,500	\$5,442	\$572,419	\$112,947

*During December, 730,600 pounds of rubber waste was exported to United States, making a total of 6,281,100 pounds for the nine months ending December, 1915.

*During December, 109,414 pounds of gum chicle was exported to the United States. During the nine months ending December, 1915, 20,000 pounds of gum chicle was exported to Great Britain, 1,187,996 to the United States, and 66,834 pounds to other countries.

THE RUBBER SCRAP MARKET.

NEW YORK.

GENERALLY speaking, the rubber scrap market has been quiet during the past month, with firm prices ruling at practically the same levels of a month ago. Prices for boots and shoes early in the month had an easier tendency than the week before, and declined $\frac{1}{4}$ cent per pound. This, however, failed to interest the large buyers, although enough business was indulged in at 10 $\frac{1}{2}$ to 11 cents to support the market. Toward the end of the month trading of a fairly active nature resulted in considerable business being done at 11 cents and a shade under that price.

The month's transactions in mixed auto tires appeared to be confined to small sales, at prices around 6 $\frac{1}{2}$ cents. However, sales to the mills at 6 $\frac{1}{2}$ cents were reported later in the month. G. and G. tires have had some call at prices ranging from 8 $\frac{1}{4}$ to 9 cents, but the large buyers were not interested. Inner tubes continued to be a largely speculative feature and the price to the

mills of 30 to 31 cents for No. 1 tubes is nominal. Solid tires were unchanged.

The mechanical grades have gone very well with No. 1 white scrap leading at 13½ cents but the demand, which included black scrap, fell off toward the end of the month.

A new circular setting forth the changes in packing rubber scrap that were adopted recently by the rubber scrap division, can be obtained from Chairman Paul Lowenthal or from Secretary Haskins of the National Association of Waste Material Dealers.

United States imports of rubber scrap for the year ending December 31, 1915, were 12,342,117 pounds, value \$877,026. Exports of domestic scrap for the same period was 3,117,750 pounds, value \$350,350.

NEW YORK QUOTATIONS FOR CARLOAD LOTS DELIVERED.

MARCH 30, 1916.

Prices subject to change without notice.

Boots and shoes	Per Pound.
Tanned articles	\$0.10 to .11
White tires, Goodrich and Goodyear	.08 1/2 to .09 1/4
Auto tires, standard white	.06 1/2 to .07
standard mixed	.06 1/2 to .07
stripped, unguaranteed	.04 1/2 to .05
Auto peelings, No. 1	.09 1/2 to .10 1/2
No. 2	.09 to .09 1/2
Inner tubes, No. 1	.30 to .31
No. 2	.13 to .14
red	.13 1/2 to .14
Irony tires	.02 1/2 to .02 3/4
Bicycle tires	.04 to .04 1/2
Solid tires	.05 1/4 to .06
White scrap, No. 1	.13 1/2 to .16
No. 2	.10 to .13
Red scrap, No. 1	.10 to .11 1/4
No. 2	.08 to .10
Mixed black scrap, No. 1	.04 1/4 to .05 1/2
No. 2	.04 1/4 to .04 3/4
Rubber car springs	.04 1/2 to .05 1/2
Horse shoe pads	.04 1/4 to .04 3/4
Mattings and packings	.01 to .01 1/4
Garden hose	.01 to .01 1/4
Air brake hose	.06 to .06 1/4
Cotton fire hose	.02 1/2 to .03 1/2
Large hose	.02 to .02 1/4
Hard rubber scrap, No. 1, bright fracture	.26 to .28
Battery jars (black compound)	.03 to .03
Insulated wire stripping	.04 to .04 1/2
Rubber heels	.03 1/2 to .04

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

THE market for chemicals has maintained the same characteristics as that for February. The tendency, in most lines, to advance has become effective. Spot stocks of the principal materials are small and manufacturers dependent on them are paying almost prohibitive prices. Not many, however, are so situated, as there are probably none among the large buyers without the protection afforded by contracts.

LITHARGE.

An advance of 1½ cents per pound has taken place during March, based on the demand which advanced pig lead.

ZINC OXIDE.

The domestic supply is practically used up in filling contract orders, leaving very little surplus for new accounts. There are no fixed quotations for spot sales which are all in second hands.

New contract prices for French process zinc oxide for the second quarter-year took effect March 1. They are as follows in cents per pound: white seal 25¢ to 25½¢; green seal 24½¢ to 24½¢; red seal 24¢ to 24½¢.

LITHOPONE.

Lithopone is almost out of the market. Consumers not covered by contract are unable to obtain large amounts and are obliged to pay excessive prices to obtain any supply.

CAUSTIC SODA.

The output is heavily sold ahead and stocks are scarce. Prices are firm, but have not advanced materially over those ruling a month ago.

SULPHURIC ACID.

The production is believed to be increasing. Stocks are at very low level. There is no evidence of a weakening in prices.

PRICES OF CHEMICAL AND COMPOUNDING INGREDIENTS

NEW YORK, MARCH 30, 1916.

Subject to change without notice.

Acetone (drums)	lb.	\$0.45	to	\$0.46
Acid, acetic, 8 per cent (bbls.)	gal.	.09	to	.10
Acrylic (ceride)	gal.	.20	to	.20
Alcali, 99% (carboys)	50	to	50	
Aluminate, 20%	ton	.02 1/2	to	.03 1/4
nitric, 26%	ton	.06	to	.07
Aluminum Fluoride (No. 1)	ton	15.00	to	17.00
Aluminum Flake (carloads)	ton	18.00	to	20.00
Ammonium carbonate	ton	.08 1/2	to	.09 1/2
Asphaltum, cream, sulphur of (casks)	lb.	1.00	to	1.00
Antimony, cream, "Alphasto" (casks)	lb.	.85	to	.85
golden, sulphur of (casks)	lb.	1.00	to	1.00
golden, sulphur of, States brand, 16 1/2%	lb.	.65	to	.65
Asbestos	ton	19.00	to	20.00
Asbestos	lb.	.04	to	.20
Asphaltum, cream, sulphur of (casks)	lb.	1.00	to	1.00
Barium sulphate, precipitated	ton	10.00	to	10.00
Barites, pure white	ton	18.00	to	21.00
Barites, off color	ton	15.00	to	16.00
Bauxite	ton	1.00	to	1.00
Benzol, pure	gal.	.80	to	.90
Beta-Naphthol	lb.	1.50	to	1.75
Black Flyer	lb.	.39	to	.40
Bone ash	lb.	.10	to	.10
black	lb.	.03 1/2	to	.07
Cadmium tri-sulphate	ton	None	to	None
yellow	ton	None	to	None
Canella gum	lb.	.27 1/2	to	.35
Carbolic, (solid) (drums)	ton	1.00	to	1.00
(black, cases)	ton	.10	to	.12
Carbolic, (solid) (drums)	ton	.17	to	.18
Carbolic, (solid) (drums)	ton	6.25	to	6.25
Carbolic, (solid) (drums)	ton	.04	to	.05 1/2
China clay, domestic	ton	10.00	to	12.00
China clay, imported	ton	12.50	to	30.00
Chrome, green	ton	.17	to	.17
China yellow	ton	.32	to	.32
Coal tar	ton	5.00	to	5.00
Corn oil, refined	lb.	.11	to	.11
Cotton linters	ton	.06 1/2	to	.06 1/2
Emarex	ton	100.00	to	100.00
Gas black	ton	.29	to	.29
Gilsonite	ton	37.50	to	42.50
Glycerin, U. S. P. (domestic)	ton	.56	to	.57
(graphite, flake, 400 pound bbl.)	ton	.17 1/2	to	.17 1/2
powdered (400 pound bbl.)	ton	.05	to	.05
Green oxide of chromium (casks)	ton	.68	to	.76
Ground glass	ton	.02 1/2	to	.02 1/2
Indian red, reduced grades	ton	.03 1/2	to	.05
pure	ton	.07	to	.08
Infusorial earth, refined	ton	60.00	to	60.00
bolts	ton	60.00	to	60.00
Iron oxide, red, reduced grades	ton	.02 1/2	to	.06
red, pure, bright	ton	.05	to	.05
Hemingsway	ton	.05 1/2	to	.08 1/2
Ivory, black	lb.	.10	to	.24
Lampblack	lb.	.11	to	.15
Lead, red oxide of	lb.	.09 1/4	to	.09 1/4
sublimed blue	lb.	.08 1/4	to	.08 1/4
white, basic carbonate	lb.	.08 1/4	to	.08 1/4
white, basic sulphate	lb.	.08 1/4	to	.08 1/4
lime, flour	ton	.01 1/2	to	.01 1/2
Litharge	ton	.09 1/4	to	.11
Lithopone, domestic	lb.	.14	to	.15
Imported	lb.	.14 1/2	to	.15 1/2
Magnesia, carbonate	lb.	.11	to	.16
calcined, heavy	lb.	.16	to	.45
heavy, Thistle Brand	ton	.10	to	.10
light	ton	.35	to	.40
Magnetite, calcined, powdered	ton	35.00	to	39.00
Male, powdered	lb.	.03 1/2	to	.05 1/2
Male, rubber	lb.	.01 1/2	to	.03 1/2
Naphtha, stove gasoline (steel bbls.)	gal.	.24	to	.24
66 to 68 degrees	gal.	.28	to	.28
68 to 70 degrees	gal.	.28	to	.28
N. M. S. gal.	gal.	.23	to	.23
Oil, aniline	ton	.90	to	1.00
linseed (bbl.)	gal.	.77	to	.81
oil	ton	.16	to	.20
paraffin	gal.	.17	to	.20
pine (cases)	gal.	.65	to	.65
rapeseed	gal.	1.03	to	1.15
rosin, heavy body	gal.	.32	to	.36
tar (cases)	gal.	.20	to	.20
soluble, aniline colors	ton	3.50	to	5.00
blue, green	ton	1.25	to	1.25
Orange mineral, domestic	ton	.11	to	.11
Paraffin	ton	.04	to	.04
Petroleum	ton	.02 1/2	to	.02 1/2
Petroleum grease	ton	.04 1/2	to	.04 1/2
Pine tar, retort	gal.	.14	to	.14
Pitch, burgundy	ton	.04 1/4	to	.05 1/2
pine	ton	.02 1/2	to	.02 1/2
Plaster of paris	ton	1.50	to	1.70
Prussian blue	ton	nominal	to	nominal
Pumice stone, powdered (bbls.)	ton	.02	to	.03
Resin, Pontianak, refined	ton	.15	to	.15
granulated	ton	.12	to	.12
tin	ton	.10	to	.10
Rosin (280 pound bbls.)	ton	5.65	to	.04
Rotten stone, powdered	ton	.02 1/2	to	.04
Rubber black	ton	.04 1/2	to	.04 1/2
Rubber compound, Richmond brand	ton	.02	to	.02
No. 64 brand	ton	35.00	to	35.00
Rubber substitute, black	ton	.09	to	.20
white	ton	.13 1/2	to	.18



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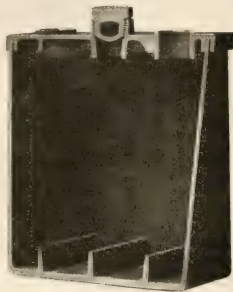
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A NEW BATTERY JAR COVER.

An improved battery jar cover, illustrated herewith, is made entirely of hard rubber. The outside lower edges are formed

in the shape of a channel that fits over the top of the jar. This method of construction adds greatly to the stiffness of the jars, thereby reducing the danger of breakage. A little sealing compound is used to make the connection between the cover and jar perfectly tight and acid proof. The cover is easily removed when necessary by simply heating the joint with a gasoline torch. [Victor Storage Battery Co., Rock Island, Illinois.]



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TABLE OF CONTENTS ON LAST PAGE OF READING.**UNPROFITABLE INFRINGEMENT NO EXCUSE.**

THE decision of the United States Court of Appeals in the Grant patent case, some account of which appears in this number, is one of far-reaching importance, not only to the tire trade, but every branch of business which in any way relies upon patents which may be the subjects of infringements.

The question of the amount of damages due the patentee has always been a mooted one. Usually such damages have been limited to the amount of profits made by the infringers, or to such damages as could be distinctly shown, based on license fees, loss of sales or diminution of price, caused by such infringing competition. This has, time and time again, resulted in completely nullifying such verdicts, owing to the difficulty of proving that the infringers made any profit, or that the patentees would have made sales, had there been no infringers in the field. Then again, in case the patentee did not grant licenses, the basis for damages for loss of license fees could not be computed.

This decision, however, is to the effect that a plaintiff in an infringement case may recover what to the court or jury seems fair and reasonable, whether the defendant may or may not have made any profits, whether the defendant did or did not grant licenses and without the necessity, on the part of the defendant, of actually proving loss of sales or reduction of price because of the infringement.

DEMONSTRATIVE PUBLICITY.

AS a rule, public opinion is influenced through certain means of publicity, by letters sent direct to individuals, by pamphlets distributed where they will do the most good, by newspaper articles, and by public meetings and eloquent speakers. A certain proportion of the people are influenced by these, but while each and all are to a certain extent effective, there are many people, particularly among certain classes, who are not reached by such exploitation. A band of music followed by marching men attracts the attention of such, and sets them to thinking, much as the printed propaganda does the other classes. That is why a parade is a good thing. It brings publicity to a movement. Former parades of this kind have been beneficial in influencing public thought. The preparedness parade to be held in New York next week is of value in extending public thought on this important question. In the past, the rubber trade will do its share in making the parade a success. Indeed, it is said that it will contribute between two and three thousand to the ranks of marching men.

THE SOLVENT NAPHTHA PROBLEM.

THE price of gasoline, which is a present subject of comment, investigation and speculation, is a very vital question to rubber manufacturers. The fact that they use automobiles and motor trucks, which cost much more to operate, is of minor importance. Where the shoe really pinches is the greatly increased price of solvent naphtha, and this is problematical—the lessened use of tires, inner tubes and motor accessories that may come through a letting up in general motoring.

Naphtha, from the days of Macintosh, has been almost a necessity in rubber manufacture. The lines most dependent upon it are cements for leather shoe manufacture and tire repair; dipped goods; spreader work, as proofing, rubber clothing and mackintoshes; rubber footwear; tires; druggists' sundries and mechanical rubber goods. Indeed wherever any union of parts is desired, naphtha is the usual agent to bring it about.

The gasoline production in the United States for 1915 was 41,600,000 gallons. Of this, 6,500,000 gallons was exported, leaving 35,100,000 gallons for home consumption.

tion. Foljambe, of the S. A. E., estimates that the automobile trade will need 42,000,000 gallons for 1916, and that other industrial uses will call for 21,000,000 gallons.

The users of this amount will be motor boats, stationary internal combustion engines, dry cleaning establishments, rubber manufacturers and chemical manufacturers. Just what proportion of this is used in the rubber trade is only a guess. Supply men off hand say from 4,000,000 to 5,000,000 gallons. Rubber manufacturers think it is very much more. One who uses 3,000 gallons a day puts the amount at twice 4,000,000.

Whatever the amount needed, the increased price is serious, not only to the dipped goods, spreader and cement producers, but to all rubber manufacturers. With cheap gasoline it has hardly been thought worth while to try to recover the solvent which evaporates. Now, however, in spreader work, that will undoubtedly be done more or less completely in the near future.

The price of gasoline, which was as low as 9 cents a gallon in 1911, gradually rose to 16 cents, dropped back to 13 cents, and finally rose to 20 cents and is now 28 cents. Nor is there any immediate relief promised. Of other solvents in sight, benzol is that to which the trade, in normal times, would turn. But its use in warfare has put its price so high that it is at present out of reach.

In the meantime, economy in the use of gasoline, governmental investigations and cracking processes, may keep the price down to its present level. Of course, continued high prices would, in time, stimulate the production of gasoline from natural gas and from the shales, or the establishment of benzol plants simply for rubber use. But all that takes time and the plants devoted to such work might not be able to compete when gasoline returns to its ten cent level.

PRACTICAL PATRIOTISM.

THERE have been many Americans who, honest and fair in their dealings with individuals, have taken every advantage of the government. "The State has no friends" was a proverb among such. The same has been true of corporations big and little. That a decided awakening has come about, however, is shown by the work that many business men, heretofore indifferent, are doing to make the country better. This is not confined to any one industry, but a notable case points these remarks, and it is in the rubber trade, too.

The Federal Government needed much expert advice in connection with aeronautics, such as balloon fabrics. No money was available for such work. The splendidly equipped research laboratory of one of the great rubber corporations was at once put at the service of the government, without cost, and the problems solved. Such willing, broad-gage patriotic service is one of the most hopeful signs of the times.

THE SEPTENNIS SYNTHETICUS.

IT is a disease that occurs in the rubber trade at frequent intervals, but in its most virulent form about once in seven years. Since the discovery of vulcanization it has broken out badly ten times. The symptoms are profound secrecy, feverish avarice and alternating fits of marked exaltation and deep depression. Its victims are capitalists, half-educated chemists, occasional rubber manufacturers, widows and orphans. It breaks out in widely separated localities. Massachusetts, New Jersey, New York, Ohio have been afflicted at intervals and have both recovered and suffered relapses. At the moment of writing the disease has broken out in Brooklyn. The attack is in this instance not of the most virulent type. One patient is still in a very feverish condition and bewails the loss of some \$31,000. Another, possibly under temporary aberration, has disappeared leaving only a huge tank containing a sticky tar-like mixture. Federal specialists, having been called promptly, hope to localize the outbreak and predict speedy convalescence if not recovery of the money.

COLOR IN TIRES.

THE non-technical press is at the moment questing for information as to how tires are colored. A non-conscientious expert could flood the country with the statement that tire colors were obtained by dyeing after vulcanization, or by the chemical action of the violet ray, and the tale would obtain credence.

Instead, the reply is after this fashion, although the analogy is not quite perfect: For white bread the baker uses white flour; for brown bread, brown; for black bread, black. And if red bread were desirable red flour would be used. So with tires, white rubber tires contain white flour (zinc oxide); black tires, black flour (carbon black); red tires, red flour (sulphuret of antimony). There are, to be sure, many other whites, blacks and reds that may be used, but the principle remains the same. The rubber dough is simply colored by mixing a dry color in it before baking.

ONE OF OUR INTERESTING AND POLYSYNTHETIC CONTEMPORARIES advises purchasers of rubber packing to insist upon the floating test as a guide to its value. In other words, pure rubber and sulphur is what the writer believes the buyer should aim to secure. The facts, however, run a trifle contrary to such assumption. Sponge rubber floats, also rubber compounded with floating substitute, and would last about as long in steam as a slice of Swiss cheese. On the other hand, rubber weighted down with plumbago, asbestos, infusorial earth, and other heat resisters, while it will sink like lead in water, will outlast and outpace anything else in the world. But then, no engineer would try the test anyhow. He buys of a friendly salesman who has bully cigars and never mentions water.

The Manufacture of Balloon Fabrics in Europe.

Special Correspondence.

DOUBLING

LINED or "doubled" fabric is so made that each of the fabrics which are brought together is coated separately, one sufficiently to be gas-proof, the other but lightly gummed. After being prepared in this manner the fabrics are passed together through a "doubler," and vulcanized.

A buffing calender is used in lining balloon fabrics, this calender being composed of two hardened steel cylinders. The under cylinder is geared, while the upper one is free and presses on the lower one. The pressure between the cylinders is adjusted by weights and springs. It must be perfectly regulated, as excessive pressure causes wrinkles to form in the fabric, while insufficient pressure causes the cylinders to draw the fabrics at varying speeds and the finished material has a tendency to separate.

The sheet of fabric coated with the thick gas-proof solution must pass over the upper cylinder of the calender, while the sheet coated with the thin solution passes over the lower one. In Germany they prefer to line or double their balloon material with diagonal warp fabrics. In France, on the contrary, straight-thread fabrics are usually employed for this purpose; in the latter case, the warp as well as the weft threads of both plies of fabric are parallel to each other. Great care must be exercised in calendaring straight-thread combinations. The threads of both layers must be perfectly parallel and the tension on the fabrics must be even, for should some threads be tighter than others they will be subjected to a greater strain when in use and their tensile strength will be impaired. They also will warp and endanger the rubber connection between the layers of fabric. The total tensile strength of a doubled fabric is never equal to the sum of the tensile strengths of each layer; and diagonally-lined fabrics are not as strong as fabrics lined parallel, because of the fact that it is almost impossible to obtain even tension throughout. By tearing a sample of diagonally-lined fabric it is quite evident how irregular this fabric really is. But diagonal or cross-thread linings have their advantages. For instance, these will not allow a rent to spread so easily as in the case of parallel-thread fabrics, and are more perfectly gas-proof.

VULCANIZATION.

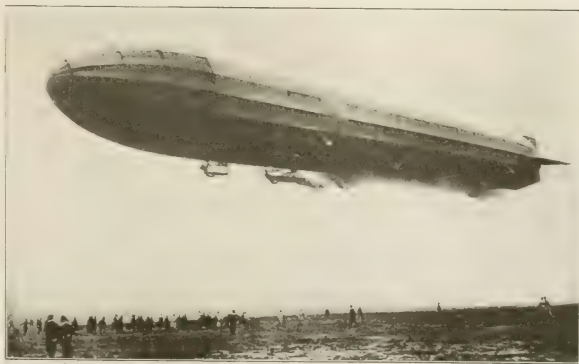
Heat-cured balloon fabrics are vulcanized in steam or in a steam-jacketed vulcanizer in hot air under pressure. The latter method is employed when colors used are sensitive to the effects of steam, also for silk and flax fabrics which cannot stand steam. When ready for steam vulcanization the balloon fabric is wound on a hollow iron drum, about 5 yards in circumference, and

open at both ends. This drum is first covered with several layers of thick, rubber-coated fabric, which are vulcanized at the same time with the balloon fabric. The object of these extra layers is to protect the balloon fabric from any steam that might find its way through the rivet holes of the drum and also prevent over-vulcanization of the lower layers of balloon fabric. Previous to wrapping, the rubberized surfaces are thoroughly powdered with talc. In fabric colored with chrome yellow it is essential that it be wound so that yellow comes upon yellow, even if the material only has one intermediary coat of rubber. Wrapped in this manner, fabrics colored with lead chromate give better colors than if the yellow surface had come in contact with the layer of rubber while being vulcanized.

Should the color of the rubber-coated inner surface be damaged, it is of but little consequence, but for the outer side, which ultimately will be the outside of the balloon, it is essential that the material be perfectly uniform and yellow in color. Several layers of fabric rubberized on one side, or several plies of material rubberized on both sides, are wound with the balloon fabric so that the rubberized surfaces of the latter are wound against rubberized surfaces. Talc prevents sticking. Several layers of material, rubberized on one side only, are also wound over the whole, to prevent steam reaching the balloon fabric. When dry air vulcanization is used the rubberized coverings are not necessary and a few layers of ordinary material afford sufficient protection, except in cases where chrome yellow is used for coloring, when it is preferable to retain the gummed wrappings, for the least humidity that might penetrate to the fabric during vulcanization would decompose the lead chromate.

Once wound on the hollow iron drum, the whole is run into the vulcanizer on a truck and the door is closed. The length of time necessary for vulcanization varies with the thickness of the materials and the thickness of the rubber coating, as well as with the length of the piece, *i. e.*, the number of plies wound around the drum. Dry steam vulcanization may require

from 50 to 90 minutes and the temperature should never be allowed to exceed 133 degrees C. (342 degrees F.). When vulcanization is finished the drum is run out and allowed to stand until the fabric is completely cool. Upon being removed from the vulcanizing drum the fabric should be thoroughly powdered with talc and then carefully brushed. Fine paraffined talc should be used. Dry vulcanization in a jacketed heater is difficult, as the heat often fails to penetrate all the layers of fabric. If vul-



A LATE TYPE OF ZEPPELIN IN FLIGHT (RIGID).

*The second installment of this article has just come to hand, having been unavoidably delayed.

canization is pushed too rapidly the outer layers are vulcanized before there is any action at all on the inner layers. A sheet of tin-foil inserted between the layers of fabric, and just as wide and as long as the fabric, will remedy this trouble and bring about uniform vulcanization. Even by injecting hot air under pressure into the heater good results would not be obtained, because the fabric is a poor conductor of heat. Low temperature and slow progressive vulcanization are therefore necessary. Even with this method there are differences in the degree of vulcanization of the several layers of fabric.

The old time dry heater is better. In this the material is hung in the heater and slowly and evenly vulcanized. In this connection, Worrington's continuous vulcanization oven is worthy of special mention. This heater, which is popular in England, has a quadrangular chamber 9 feet long and 15 feet high, at the top and bottom of which geared rollers are arranged. The fabric is placed on a drum outside of the chamber, into which it is drawn by an endless chain through a slit in the walls. The fabric comes out of the heating chamber through another slit at the top, and is again wound on a large drum. The chamber is heated by steam pipes and the fabric passes slowly through it, making zig-zags over rollers. It takes the fabric from 2 to 3 hours to go through this vulcanizer.

For very fine fabrics cold vulcanization is preferable. The usual process is that of a solution of chloride of sulphur in bisulphide of carbon. It is commonly held that fabrics vulcanized in this manner do not last. This is often true, though not always. Failure should not be attributed to the method but to the mixture of the solution with ingredients which do not act properly in contact with chloride of sulphur. Account must be taken of the fact that chloride of sulphur creates reactions with other materials than rubber. Oxide of zinc and hydrated lime must be left out when chloride of sulphur is used, for they give bad results. The rapidity with which chloride of sulphur adds itself to rubber depends upon the degree of penetration of the solvent. As a solvent carbon bisulphide has proven best because its boiling point is constant and not too high (being below 212 degrees F.). Further, it swells the rubber, penetrating it faster than the chloride can vulcanize it, and thus an even, regular vulcanization is obtained.

If the boiling point of the solvent is too low the rubber may not be very deeply penetrated; concentration increases very rapidly and the speed of the reaction between the chloride and the rubber is much increased. For this reason a homogeneous vulcanization cannot be expected. A too rapid evaporation of the solvent lowers the temperature of the surface, a sort of dew forms on the surface of the rubber, which decomposes the chloride of sulphur. Naphtha has no constant boiling point; it does not penetrate the layer of rubber fast enough and should

not be used. Benzol can only be used in a very pure state and then, like tetra-chloride of carbon, it is too expensive. It is important that the bisulphide of carbon and the chloride of sulphur be perfectly dry, for water decomposes the latter, generating hydrochloric acid and sulphur. For cold vulcanization the following installation is necessary: a boxwood cylinder running in a long, narrow wooden trough lined with lead.

A short time before beginning operations for vulcanizing, this trough is filled with a solution of carbon bisulphide and chloride of sulphur composed of from 1 to 2½ parts of the latter for 100 parts of the former. The coated fabric is stretched tight and slides over the cylinder; sufficient liquid being thus taken from the cylinder to cause vulcanization. Next the fabric is passed

over a heated drum to evaporate the solvent. Then the material is wound up. The wooden cylinder must be perfectly round and smooth, and must run true, so that the material is evenly coated. Otherwise a sort of marbled effect will be the result. Sometimes a porcelain trough and cylinder are used.

The more the material is wound the greater the speed, because the circumference of the roll is always increasing.

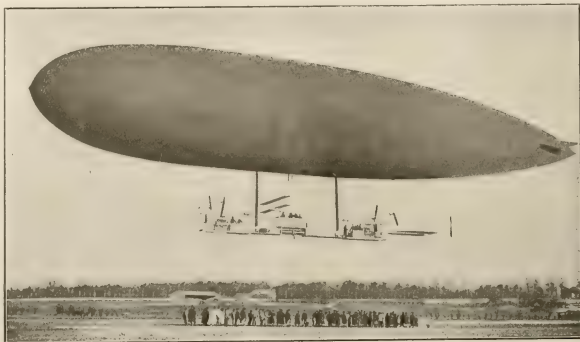
But this is of little importance, for the faster the cylinder turns the more vulcanizing liquid it picks up and the shorter the time of contact with the liquid. The material is thus perfectly covered from the beginning to the end.

Another method of cold vulcanization is by using the vapors of chloride of sulphur. The web of coated fabric is run up and down on rollers which keep it constantly moving in an airtight room, just as for hot vulcanization. This room must be wider than the material and provided with a perfect, controllable ventilating system.

Small heaters are placed under tanks containing chloride of sulphur to vaporize it. The temperature of the vulcanizing room must go above 77 degrees F. The vapors must not be generated too close to the material, and it is preferable that they be developed to the side and near the ground. The quantity of chloride of sulphur is based upon the size of the room, the thickness of the rubber coating and the time. A material with 100 grams (3.52 ounces) of inserted rubber is vulcanized in 30 minutes with chloride of sulphur at 5 per cent. When the vulcanization is finished, ventilators are opened, or, better, hot air is blown into the room to drive away the fumes. The material is then hung up to dry 24 hours in another perfectly dry room. Humidity must be avoided. Hydrochloric acid gas which is produced by dampness creates a combination that weakens the fabric by the formation of hydrocellulose. It is not advisable to use ammonia to neutralize the hydrochloric acid, for it has been proven by experience that an excess of ammonia has an unfavorable effect upon the fabric and the rubber coating. After vulcanization the material is measured and its weight to the meter determined.

CAUSES OF DETERIORATION OF BALLOON FABRICS.

Copper or its alloys coming in contact with the sulphurized

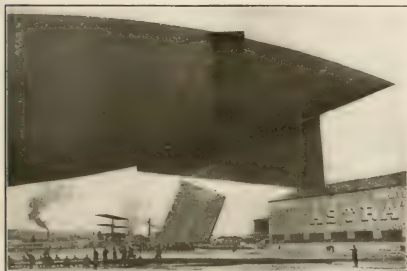


"CAPITAINE FIEBER" (FRENCH NON-RIGID).

rubber of balloon fabrics, forms copper sulphide which rapidly deteriorates the rubber. For this reason, therefore, fittings and accessories should never be allowed to come into contact with the surface of a balloon. Further, rubber that has been handled in copper vessels should never be employed in proofing balloon materials. Even iron, especially when it is rusty, will cause trouble if it is allowed to touch rubberized balloon fabric for any length of time. The enormous surface a balloon offers to the contact of air and light is also a cause for the generation of sulphuric acid in the rubberized fabric of which it is made. One manufacturer attempts to lessen the effects of these agents by adding pitch, asphalt, or paraffin, to the proofing mixtures, but

OUR NEW NAVY DIRIGIBLE.

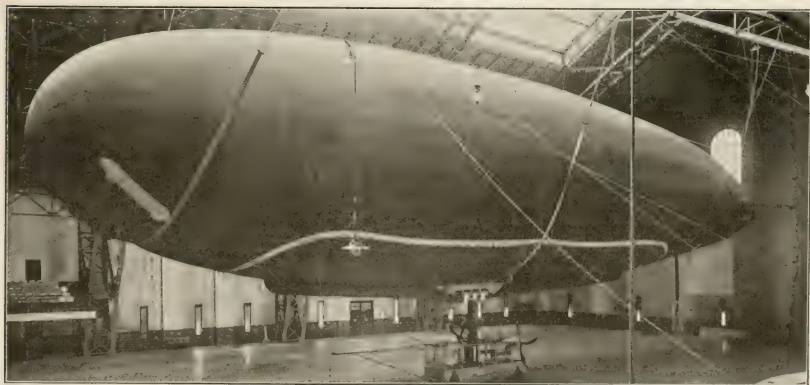
THE first dirigible owned by the United States Navy is shown here as set up in the State Armory at Hartford, Connecticut. It is the first of several which it is hoped the government will order in its new issue of preparedness. The dirigible is 175 feet long, 35 feet in diameter and 50 feet high. It weighs 5,000 pounds and has a lifting capacity of 2,000 pounds more, or a total of 7,000 pounds. The envelope will contain 150,000 cubic feet of hydrogen and the craft will travel at a speed of 35 miles an hour. The car is 20 feet long and 5 feet wide, and will accommodate a crew of eight. It is built so that it will float on water. Motive power is provided by an 8-cylinder gasoline engine operating two propellers, one on each side of the car. The balloon proper consists of two parts, an outer envelope and two inner balloonets. The envelope is filled with hydrogen gas and balloonets are to hold air which is pumped into one or the other or exhausted, as is needed to elevate one or the other end of the balloon that it may rise or descend. The entire strain falls upon the outer envelope, which for this reason is made of a very strong, double texture fabric, about 2,500 yards being required. This fabric was furnished by the United States Rubber Co., and represents a large amount of study, time, effort and expense. The outer fabric is cut in pieces at an angle of 45 degrees from the line of weaving, joined together in a strip the same width as the inner fabric, which is run through straight with a warp when the two, already proofed, are cemented together and vulcanized. Great care has been taken that there are no thick threads or knots, and that it is thoroughly impermeable, no holes even of the smallest possible size being permitted. The inner fabric is dyed green and the outer, orange. It was manufactured under the direction of W. A. Gibbons of the United States Rubber Co.'s general laboratories. The balloonets are of single texture and of lighter weight, this being feasible as no heavy strain will come upon them. The shaping of the big bags, and the setting up of the balloon was done at the Naugatuck factory of the company. The preparation of the fabric was at the Cambridge factory. We understand that the company is now at work upon other orders for similar fabrics from balloon and aeroplane manufacturers, and that it has quite an extensive and varied line of similar fabrics of single and double texture, in a variety of colors especially suited to such purposes.



STERN VIEW OF "L'ECLAIRER CONTÉ" (FRENCH NON-RIGID).

it must also be borne in mind that the purer the rubber the better it will stand air and light. Another cause for the deterioration of balloon fabrics exists in the methods employed in bleaching and preparing the fibers used in the weaving of these materials.

To preserve the balloon itself, it is important that the place where it is kept be as dry and dark as possible. Yellow or red windows are desirable for the shed or hangar in which the balloon or balloon material is to be kept, especially if the windows have an eastern exposure. Balloons should always be dried, like the balloon material, by natural air, but not in the sun.



UNITED STATES NAVY DIRIGIBLE AIRSHIP DN-1.

Perlman Wins the Demountable Rim Suit.

The final decision of the courts in favor of Louis H. Perlman establishing the validity of his patents, and enjoining the Standard Welding Co., is of great importance to the automobile trade. The advantages of the demountable rim are self-evident and well-known in the trade. The first public use of this invention was in June, 1905, when Thery substituted a new tire for a damaged one in 80 seconds, an unprecedented feat. He used the invention of Gaston Vinet, patented in March of

that year. Szisz won the Grand Prix in 1906 in a Renault car equipped with Vinet rims. About 1907 the Standard Welding Co. and other concerns began making demountable rims.

Louis H. Perlman, of New York City, applied for a patent for a "removable" rim on May 21, 1906. This application was continued and substituted by another filed June 29, in which the word "detachable" was used. Later "demountable" was advised by a patent examiner.



LOUIS H. PERLMAN.

Vinet's patent of 1905 was cited by the U. S. Patent Office.

Mr. Perlman conceived the need of some such invention away back in 1900. Several times, while riding in a friend's machine, he shared tire troubles with his host, and three years later the idea of a demountable rim shaped itself in his brain.

Mr. Perlman's first rim was completed by July 1, 1903. The first real road test was on a Royal car in August, 1904, after the preliminary rim had been improved by Mr. Perlman in some particulars. To be brief, Mr. Perlman's solution of the demountable rim problem lay in his invention of the separating wedge, the bolt and the nut, and the use of the short-stem lug and the air space between the rims. His idea was not to obtain the greatest measure of contact between the tire and the wheel rim which had been the aim of others. Although Mr. Perlman believed he had a perfectly original invention when he entered the Patent Office in May, 1906, it was not until February 4, 1913, that his patent No. 1,052,270 was finally granted. For the better part of five years he argued and argued in order to obtain claim No. 10. It took him that time to convince the authorities that he had a mechanical improvement of a patentable character. Then followed more delay before claims Nos. 11, 12 and 13 were allowed. His persistence was needful, because it was upon the infringement of claims 8, 11, 12 and 13 that he filed his memorable suit against the Standard Welding Co. in October, 1913.

Claim No. 8 covers the short-stem lug; and claims 11, 12 and 13 cover the means for locking a demountable rim to a wheel. The importance of these claims so far as the whole industry is concerned is such that they are quoted here in full:

8. The combination of a demountable rim having radially disposed clincher flanges, a tire shoe having beads engaging said flanges, a wedge-shaped clamping plate bearing against said

beads and adapted when moved to force said beads against said flanges, and means accessible from the inside of the rim for drawing the clamping plate radially toward the rim.

11. The combination, with a wheel body, of a demountable rim therefor, a locking element, having a tapering portion, that is adapted to be moved radially and to thereby exert pressure against the rim outwardly radially of the wheel body, and to act as a wedge laterally, said locking element having an engagement with the wheel body whereby it may be moved radially of the wheel body.

12. The combination with a wheel and its felly, of a demountable rim therefor, a locking element having a tapering end that is adapted to be moved radially and to thereby act as a wedge laterally and exert pressure against said rim radially of the wheel, said locking element having a threaded engagement with the wheel structure whereby it may be moved radially of the wheel.

13. The combination, with a wheel body, of a demountable rim therefor, and a locking element, having a tapering portion, that is adapted to be moved to exert pressure against the rim outwardly radially of the wheel body, and to act as a wedge laterally, said locking element having an engagement with the wheel body.

Upon appeal by the defendant, the Standard Welding Co., the case was decided in Mr. Perlman's favor by Judge William H. Hunt, of the United States District Court for the Southern District of New York, on August 18, 1915. Later, on February 15 of the present year, the Circuit Court of Appeals unanimously affirmed the decision of the District Court. On March 8, just passed, an injunction was issued by the United States District Court for the Southern District of New York by which the Standard Welding Co., Cleveland, Ohio, is enjoined from the further manufacture and sales of demountable rims. It has been variously stated that the Standard Welding Co. has been producing of late years anywhere between 50 and 60 per cent of the demountable rims supplied to car manufacturers. Its daily production has been stated to be in the neighborhood of 12,000 rims. This gives some idea of the increased demand for this feature of motoring convenience. The very words of the patent claims and the decision of the courts make it clear that almost every demountable rim maker in the country is affected by the suit.

Starting with the Perlman patent of 1906 and tracing the files down to November, 1915, the official records show the issuance of 52 so-called demountable rim patents—that is to say, for rims specifically designated as demountable; but, as a matter of fact, one will find nearer a thousand related rim patents. Curiously, 15 of the demountable rim patents appeared in 1913, the very year that the Perlman patent came out; and there were 13 others of this class, so officially designated, in the succeeding year. In 1915 ten were issued. These facts help to give the reader some idea of the inventive activity in this particular field and show how firm a grip the demountable rim has taken upon both the manufacturer and the motoring populace. While many of these inventions have been developed to a point, and a number of them placed upon the market, still but few of them have survived the test of service. According to one authority, the principal local-wedge types of demountable rims that have received general application are the "Stanweld," "Empire," "Fisk" "Firestone" and "Michelin." Of course, there are others.

The rim problem has engaged the attention of automobile engineers and inventors ever since the machines gained popularity. The files of the United States Patent Office show 746 patents of all classes dealing with rims of one kind or another, and this leads logically to the broad question of the history of rim manufacture. As has been said by one of the foremost rim makers in this country: "There is no question that ease was the greatest force back of the designing of a quick-detachable, demountable

rim. The old style rim, when puncture or blow-out occurred, many times meant hours of work in the putting on of new tires. With many rims it was necessary to send the wheel or car to the garage, before changes could be made. When a car owner started on a tour, or even on a short trip, he never knew whether he would reach his destination or not. All that is a thing of the past. The quick-detachable, demountable rim has removed the principal worry of motorists."

The rise of the demountable rim commercially dates back hardly more than five years when judged by a widespread demand. In the succeeding interval a very large percentage of car owners have either bought machines already equipped with rims of this sort or have later supplied them. This is easily explained. Tire changing has been one of the car owner's most troublesome bugaboos in the past. We have all seen him toiling by the roadside—sometimes under a broiling sun or in a pelting rain, and universally in anything but a pleasant mood. The development of the demountable rim altered all this; it made it possible for a damaged tire to be quickly removed, replaced by a good one, and then carried home to be repaired at leisure. Instead of working for half an hour or more to make a change, the substitution can now easily be effected inside of ten minutes. It is not a case of putting on a new tire and pumping it up, but, instead, the speedy adjustment of a tire already inflated for service. And it is also claimed that the demountable rim obviates the necessity of using over-sized tires, because the wedge feature and the initial loose fit make it simply part of the process to take care of the excess.

The present-day demountable rims are adaptations of the clincher rim of unit construction, so universally employed about fifteen years ago. It will be remembered that the beads of the earlier pneumatic tires were extensible to facilitate seating the tire within the clincher rim. Stability was added to the tire by stiffening or wiring the beads, and as these could not be seated readily within the clincher rim of unit construction, then came the separable rims out of which evolved the different so-called quick detachable rims. But the quick detachable rim did not obviate the pumping up of the new tire, although it did make it possible to remove a damaged tire and to put a good one on the wheel; but the substituted tire had then to be inflated more or less laboriously. A notable gain in convenience and simplicity was secured by the adoption of the demountable rim in place of the purely quick detachable rim, and in time followed what came to be known as the quick detachable, demountable rim. In the case of the demountable rim we have only to loosen a few bolts, six or eight, as the case may be, to make a change, and with equal speed another rim, bearing an inflated tire, can be shoved in place and locked firmly by the bolts.

Mr. Perlman has associated with him in this enterprise men prominent financially, and men well known in the automobile industry. Two manufacturing plants have already been secured and contracts have been signed to supply prominent automobile manufacturers with rims. Mr. Perlman estimates that the requirements for the season of 1917 will amount to one million sets, and he is confident that by August next the company will be in shape to supply that demand.

NATIONAL ASSOCIATION COTTON MANUFACTURERS' ANNUAL MEETING.

The National Association of Cotton Manufacturers held its annual meeting April 26 and 27, at the Copley-Plaza, Boston, Massachusetts. The principal address on Wednesday was by Frank A. Vanderlip of New York City, its subject being "Foreign Commerce in American Textiles."

During the Thursday session many subjects interesting to the textile industry were ably treated in carefully prepared addresses by experts in their several lines of work. In the afternoon, S. W. Stratton, Ph.D., Director, Bureau of Standards, Washington, D. C., read a paper on "Tests of Cotton Yarn and

Fabrics," with illustrations. Then followed a paper, "The Washington Conference and Its Relation to Tire Fabric and Other Testing Requirements," by William D. Hartshorne, Chairman of Committee D-13, of the American Society for Testing Materials.

FIFTH NATIONAL TEXTILE EXHIBITION.

The Fifth National Textile Exhibition and Third National Power Shows occupied the Mechanics' Building, Boston, Massachusetts, during the week of April 24-29. A very interesting program was arranged, and the exhibits of textile machinery and allied trades were fully representative of this great industry.

Among the exhibitors the following firms, whose names are well known to readers of THE INDIA RUBBER WORLD, were noted: Curtis & Marble Machine Co., Worcester, Massachusetts; American Tool & Machine Co., General Electric Co., Morse Chain Co., and Westinghouse Electric & Manufacturing Co.—all of Boston, Massachusetts. The exhibition was well attended, and many new and improved forms of mechanism were shown for the first time. The exhibits represented the most important collection of textile machinery that has ever been arranged for public exhibition.

AUTOGRAPHIC FRICTION TESTING MACHINE.

THE Bureau of Standards, Washington, D. C., has developed an autographic machine for testing the adhesion or "friction" between the plies of canvas in rubber hose, belting, etc.

The machine is operated by a $\frac{1}{2}$ horsepower worm geared shunt motor, which is belted to a cone pulley. A worm on the pulley shaft drives a worm wheel which is geared to a spur inside of the vertical steel column. This spur drives a steel rack, to the upper end of which is attached the movable grip. From the top of the machine is suspended a spring which carries at its lower end a fork for holding the test piece. Between the spring and fork is a pencil holder, in front of which is a drum carrying a paper chart on which the record is drawn.

The capacity of the spring is 40 pounds, the extension being 1 inch for 10 pounds pull. The drum is driven by a cord which passes over a small guide pulley and thence to a spool on the spur gear shaft. The surface speed of the drum is the same as the rate of separation of the plies of fabric being tested.

The method of testing rubber hose is as follows: a 1-inch section is fitted over a mandrel and placed in the fork suspended from the top of the machine, and the detached end of the fabric is secured to the lower grip as shown.

To test rubber belting, a 1-inch strip containing 2 plies is used; the plies are separated for a short distance and the ends secured in the two grips, the upper grip being a clamp held in the fork above mentioned.

As separation of the plies takes place the pencil makes a continuous record on the drum, showing the adhesion between the plies of fabrics at all points of the fabric being tested.



European Pneumatic Tire Sizes.

FRANCE was the pioneer country in the manufacture of automobile tires and used millimeter dimensions conforming with the metric system which also originated in that country. All Europe followed the French lead by using metric measurements in manufacturing automobile tires.

America entered the field later, but, instead of metric measurements, inch sizes were adopted. So today there are French or metric tire sizes universally used in Europe while inch sizes prevail in America. This state of affairs is regrettable, and the probabilities are that for a long time to come American and European tire makers will continue to use different standards.

Nevertheless, with the tremendous impulse which the war has given to the export trade in American automobiles and automobile tires, and in view of the universal movement in favor of standardization, it is of interest to briefly review the evolution of European practice and tabulate those sizes now generally in use, together with their equivalents in inches.

EUROPEAN SIZES.

Not many years ago, when the automobile industry was still in its experimental stage, practically every constructor built his product entirely in his own shops and made wheels best suited to the general characteristics of his machine, regardless of styles and sizes used by other builders. This resulted in an unlimited range of tire sizes and designs which tire manufacturers were obliged to produce and for which the motorist had to pay.

With the growth of the industry and the desire of automobile manufacturers to have a minimum of difficulty in obtaining tubes and casings to fit their machines, automobile makers were gradually obliged to follow the lead of certain large concerns which had many machines in public use and for which dealers could afford to stock tires. In other words small automobile manufacturers, to satisfy their customers had to adopt sizes used by those makes of automobiles that were most widely distributed. This was a first step towards standardization, but the number of tire sizes remained very large.

A leading European automobile tire manufacturer publishes a catalog listing tire casings and inner tubes in 38 different metric dimensions, besides 6 American sizes in inches. Many of these tires are made in an extra strong and heavy variety under the name of limousine tires which are not included in the 38 sizes and this list does not include what are known as oversize tires, that is to say, there is no 815x120 millimeter variant of the 815x105 millimeter tire. So that, taking account of the great number of odd sizes still in use, it can be safely said that at least 50 different sizes of pneumatic automobile tires are now on the European market. The following table gives the European sizes most widely used, together with their equivalents in inch measurements:

FRENCH OR METRIC TIRE SIZES.

Sizes in Millimeters.		Equivalents in Inches.	
Interior Diameter.	Section Diameter.	Interior Diameter.	Section Diameter.
710	90	27.95	3.54
760	90	29.92	3.54
810	90	31.89	3.54
870	90	34.25	3.54
910	90	35.83	3.54
765	105	30.12	4.13
815	105	32.09	4.13
875	105	34.45	4.13
915	105	36.02	4.13
820	120	32.28	4.72
880	120	34.65	4.72
920	120	36.22	4.72
895	135	35.24	5.32
935	135	36.81	5.32

BRITISH PNEUMATIC TIRE STANDARDS.

Many unsuccessful efforts have been made in Europe to standardize tire sizes. The principal reason of this non-success has been because of the number of cars made under old conditions and which are still in use.

In England, during 1913, T. H. Woollen of the Society of Motor Manufacturers and Traders, initiated and carried through the work of reducing the number of standard rim sizes to 20 that would take 38 standard tire sizes. As there were 38 standard tire sizes, and several oversizes as well, with only 20 rims to accommodate them, in many cases two different standard sizes of tires would fit the same rim.

In 1915, the Tire Committee of the S. M. M. T. suggested reducing the number of tire rim sizes to 10 standards while 11 different sizes would be standardized for the tires themselves. Of this range of tires two of the smallest would fit the same rim while for each of the others there would be a corresponding rim. The suggested tire standards are shown in the following table:

PROPOSED BRITISH STANDARD SIZES.

Sizes in Millimeters.		Equivalents in Inches.	
Interior Diameter.	Section Diameter.	Interior Diameter.	Section Diameter.
700	80	25.5	3.14
700	85	27.5	3.34
710	90	27.9	3.54
760	90	29.9	3.54
810	90	31.9	3.54
815	105	32.1	4.13
820	120	32.3	4.72
880	120	34.6	4.72
895	135	35.2	5.31
935	135	36.8	5.31
915	175	36.0	6.88

* Fits 650 x 65 millimeter rims.

† These tires fit the same rim.

These standards are now before the Engineering Standards Committee, a semi-governmental institution which regulates British mechanical and electrical standards, and are now awaiting the final decision of this official body.

COLONIAL SIZES.

The proposed British standards, above given, do not include sizes that are specially made for rough service in the Colonies and known as Colonial sizes. The following sizes are most in demand:

COLONIAL TIRE SIZES.

Sizes in Millimeters.		Equivalents in Inches.	
Interior Diameter.	Section Diameter.	Interior Diameter.	Section Diameter.
1,010	90	39.76	3.54
1,020	120	40.16	4.72
1,080	120	42.52	4.72
1,000	150	39.37	5.91
1,050	150	41.34	5.91

Some British tire manufacturers consider a 915x105 millimeter (36.02x4.13 inches) tire as a Colonial size.

CONTINENTAL EUROPE.

The lessons of the war have emphasized the advantage of standardization, and reports from both France and Germany indicate that serious efforts will be made in these countries at least to standardize tire sizes after the war. All recognize that, although standardization pushed too far may lead to the stifling of originality, it is preferable to a chaos of tire sizes which leads to confusion and difficulty in obtaining air tubes and casings, not to mention the fact that lack of standardization makes tires more costly.

Hard Rubber in Automobile Construction.

THE following interesting and instructive paper by McConnell Shaak, manager of the hard rubber department of The B. F. Goodrich Co., Akron, Ohio, was read at the meeting of the Cleveland Section, Society of Automobile Engineers, held at Cleveland, Ohio, December 17, 1915:

Although rubber of the hardness of an automobile bumper or of a solid tire is often referred to as "hard rubber," that term as used in this paper refers to rubber compounds hard enough to be machined and polished. In Europe hard rubber is known as "ebonite." "Vulcanite" was originally a trade name for a certain compound, but is now synonymous with "ebonite" or "hard rubber." "Vulcanized rubber" is a term often applied to such compounds, but speaking accurately, soft as well as hard rubber is vulcanized.

Vulcanized rubber compounds may be hard by reason of either a more complete chemical combination of the rubber with sulphur or the presence of ingredients other than rubber and sulphur. While the degree of hardness is controlled in both ways, the completeness of the combination of the rubber with sulphur is usually the greater factor. The finest grade of soft rubber, such as is found in a good rubber band, may contain 95 per cent rubber and 5 per cent sulphur and may have been vulcanized two hours, at a constant temperature. The finest grade of hard rubber such as is found in a good comb or fountain pen may contain 75 per cent rubber and 25 per cent sulphur and may have been vulcanized ten hours at the same temperature.

PROPERTIES OF PURE HARD RUBBER.

For the many purposes for which hard rubber may be used in automobile construction there are many qualities. The properties of hard rubber vary with the quality, of course. An idea of the properties of the various qualities can best be gained by taking as a standard and noting the variations of what might be called "pure hard rubber," which contains practically no ingredients other than rubber and sulphur.

Pure hard rubber ranges in specific gravity from 1.12 to 1.25. On account of the large percentage of sulphur necessary for proper vulcanization, it is impossible to make hard rubber with a specific gravity much less than 1.12. Hard rubber of fair commercial quality will usually have a specific gravity of 1.25 to 1.40.

The finest grades of hard rubber have a tensile strength as high as 7,000 pounds per square inch of cross section. Battery manufacturers who make tensile tests on their jars usually require a tensile strength around 3,500 pounds.

The United States Navy hard rubber sheet specifications which require a fair commercial quality, call for a dielectric strength of 10,000 volts per 1-32 inch of thickness. Some battery manufacturers test their jars electrically with a pressure of about 25,000 volts alternating current for $\frac{1}{8}$ inch of thickness. The finest hard rubber will withstand twice that voltage.

Hard rubber compounds, except some that contain organic substances other than rubber, are moisture proof. Pure hard rubber is unaffected by most chemicals. Concentrated nitric and sulphuric acids, carbon bisulphide, aniline and benzol are the only chemicals used largely in a commercial way that affect it at ordinary temperatures. As compared with soft rubber, hard rubber deteriorates slowly.

Hard rubber compounds before they are vulcanized are usually of about the same consistency as soft rubber compounds, that is, they are of about the same consistency as stiff chewing gum.

EFFECTS OF TEMPERATURE VARIATIONS.

Pure hard rubber has a greater coefficient of expansion than most other substances, either organic or inorganic. In cooling from the ordinary temperature of vulcanization to 70 degrees F. it shrinks about 2 per cent. In molding, this shrinkage is not altogether uniform, so that regardless of how accurately the cavities of a mold are finished, the goods have to be turned, ground, buffed or polished after they are molded according to the accuracy of dimensions and character of polish required. The coefficient of expansion of pure hard rubber after it has once cooled is .0004278 per degree F., or about six and a half times that of steel.

At a temperature of 150 degrees F. pure hard rubber softens perceptibly. At 212 degrees F. it becomes so soft that it can be easily bent, and at 240 degrees F. it becomes leathery, so that it can be readily cut with a knife. Upon cooling, it remains in the shape in which it was bent and shrinks slightly from its

original size. When warmed again it tends to return to its original shape. Each time it is heated and cooled it shrinks less than the previous time until after a few times the shrinkage is negligible. While this is the effect of heat upon most hard rubber compounds, it is possible to make them withstand the action of heat to a much greater extent by scientific compounding.

On account of its resilience, hard rubber machines less readily than would be expected, but with good grades fine work can be done. In general, the better the grade, the more easily it can be worked. A good quality of hard rubber readily takes a fine jet-black polish. This color and polish are fairly permanent, but not absolutely so, for even the finest quality takes on a slight greenish tint, especially after it has been exposed for a long time to the bright sunlight. When the finish becomes dull or discolored, it can be restored by buffing and polishing.

On account of the large percentage of sulphur in hard rubber compounds, and the comparatively long time and high temperature under which they are vulcanized, it is impossible to make hard rubber in the large variety of colors in which soft rubber can be made, for the high temperature and sulphur tend to discolor pigments. Hard rubber can be made in a commercial way in black, red and intermediate shades. It cannot be made of a clear white color at all, and most of the other colors are not usually attempted.

The quality of hard rubber may be determined roughly by superficial examination in many ways—by its color and texture as shown by a polished or freshly-broken surface, by its strength, by the ease with which it machines, and by the toughness, color and grain of a shaving. The best way is to whittle it slowly with a knife, noting the color and toughness of the shaving. With practice, one can judge hard rubber fairly accurately in this way.

The parts of an automobile that may be made wholly or in part from hard rubber may be divided into three classes—handles, parts for the ignition system and battery parts.

RUBBER HANDLES FOR AUTOMOBILE SERVICE.

In the first classification may be included handles for starting cranks and controller levers, caps for radiators, and gasolene tanks, and steering wheels. For these parts hard rubber is desirable on account of its strength, attractiveness and permanence of finish. Hard rubber for handles is usually molded except where the quantity required is so small as not to warrant the expense of a mold.

Hard rubber parts for automobiles are molded in two ways—from soft-metal or from hard-metal molds. Soft-metal molds are made from a matrix. The molds are stacked and clamped in racks and the vulcanization is done in a heater of the type formerly used for tires. Hard-metal molds for hard rubber are usually made from iron or steel the same as are those for bumpers and other soft rubber goods. The vulcanizing is also done in hydraulic presses.

For hard as compared with soft rubber, a long time is required for vulcanization so that for large production a great many mold cavities are required. With a comparatively inexpensive matrix it is an easy matter to make as many molds as may be required, but cavities in an iron or steel mold are expensive. Soft-metal molds have the advantage, therefore, of low cost of mold equipment, but they warp and stretch so that it is impossible to do nearly as accurate work with them as with hard metal molds. Furthermore, they will not withstand pressure and the result is that goods made of the same compound from hard metal molds under hydraulic pressure show greater strength. With hard-metal molds there are less defective goods and the work can be better arranged, so that iron or steel molds are the best, except where the quantity required is small.

Hard rubber steering rims have been used for the past ten years. The first ones were made entirely from hard rubber and screwed on the spiders. The screws did not hold well enough in the hard rubber and this led to the use of a hard rubber covered steel tube, also fastened to the spiders with screws. Objection was then raised to the projections beneath the rim where the arms of the spider joined it. This resulted in the use of the integral construction in which the hard rubber is molded on the rim of the spider. This type of rim is a little heavier than wood and more expensive, but it looks well when new and remains practically unchanged after years of use, without attention of any kind.

The parts in the ignition system that may be made wholly or in part from hard rubber are distributor blocks, collector rings and brush holders for magnetos, terminal connections and miscellaneous parts for magnetos, coils and switches. These parts are molded, as a rule, and the comments already made concerning the superiority of hard-metal over soft-metal molds apply.

It is a comparatively easy matter to make these parts from material that will withstand 10,000 volts per 1-32 inch of thickness and the insulation problem is therefore not difficult. To furnish material that will withstand a jump spark is another problem, for the heat of the spark tends to carbonize the rubber. The Germans are able to furnish a rubber compound that in this respect seems to be superior to any it has been possible to produce in this country.

HARD RUBBER PARTS FOR BATTERY EQUIPMENT.

Parts for batteries include hard rubber jars, covers, vents, bushings and separators. The more complicated hard rubber covers must be molded. The less complicated ones may be molded or cut from hard rubber sheet. The greater accuracy of dimensions that can be maintained with hard-metal molds is of greater advantage here than in connection with the parts previously mentioned. Most of the covers must be finished after they are molded in order to give them the required accuracy of dimensions or character of surface. It is customary to grind the edges of molded covers fairly accurately to dimensions, but to leave the other surfaces practically as they come from the molds. To finish the other surfaces would greatly increase the cost of manufacture. In other words, molded covers must be molded fairly accurately, and this can be done more satisfactorily with hard-metal than with soft-metal molds.

Flat covers are usually cut from sheet, but when large in size, and the quantity required is large enough to warrant the cost of equipment, it is often advantageous to mold them. When the same compound is used, a stronger cover can be made by molding than by cutting it from sheet, and this is a factor in determining the better method of manufacture in order to produce a cover of a given quality.

The cost per cover for operating the molds is practically the same, regardless of the size of the cover. Consequently it often happens that of a certain type of flat cover it is most economical to cut the small ones from sheet and to mold the larger ones. Hard rubber sheet from which covers are made is vulcanized between layers of tin in hot water. These sheets are about 20 x 48 inches, the exact size, of course, being determined so that there may be no excessive waste at the edges.

Battery manufacturers are probably more inclined to economize beyond the point of safety in the cost of covers than of other parts of a battery. The hard rubber cover is so small that the addition of a cent or two in the cost of material makes a considerable difference in its strength, and often a cent or two may make a very great difference in the breakage in service.

METHODS OF MAKING VENTS.

There are two types of hard rubber vents in common use, plain molded and blown. The plain molded is made in the same manner as the other molded parts previously mentioned. The "blown" vents are made hollow by the expansion of water or other liquids on the inside, this expansion being caused by the application of heat during vulcanization. It is more expensive to mold goods when they are hollow. More expensive material is required. Of course, in some designs it is essential that vents be made hollow, but wherever it is possible in order to reduce costs, vents should be so designed that all holes and irregularities can be made by the means of molds.

Such items as hard rubber terminal bushings and vent extensions are usually cut from hard rubber tubing, although here again if the design is complicated and the quantity involved is large it is more economical to mold them.

Hard rubber rods and tubes are made in much the same manner as soft rubber tubing that does not have cloth insertion. It is squirted through a die while hot, the die forming it into the desired shape. The material is then buried in soapstone, proper care being exercised to insure its being kept straight, the hard rubber rod by the way it is packed, and hard rubber tubing by mandrels on the inside. The standard length for hard rubber rod and tubing is 30 inches. As it comes from the process of vulcanization it is fairly rough and not altogether uniform in dimensions. With a grinding machine of rather simple design, hard rubber rod and tubing can be ground accurately to outside dimensions and polished at no great expense. The actual cost of manufacture, per pound, of ground and polished hard rubber tubing varies according to the weight per foot, that is, according to the diameter and thickness of wall. This is due to the fact that labor cost for grinding and polishing depends

upon the length and number of pieces rather than upon the weight. The hole in hard rubber tubing can be kept accurately centered only by turning it on a mandrel in the lathe with a special grinding machine, which, of course, increases the cost considerably.

TYPES OF BATTERY SEPARATORS.

In lighting and starting batteries, hard rubber separators have been almost altogether supplanted by treated-wood separators. Battery manufacturers tell us that with a battery of a given size they can get a higher discharge rate with the wood than with the rubber separators, and that if they used the latter they would have to increase the sizes of their batteries.

Separators manufactured in Europe are usually made from corrugated perforated hard rubber sheet, or from perforated sheet with ribs molded integrally upon it. The corrugated separator is not altogether desirable because it will flatten out in service. The separators with the ribs molded integrally with the sheet have been too expensive for most American battery manufacturers. At the present time, however, hard rubber manufacturers are aiming to reduce their costs of manufacture for that type to a point where battery manufacturers can afford to use them.

Ribbed hard rubber separators as they are made in this country today usually consist of hard rubber sheet partly cured and perforated, and ribs vulcanized on the sheet afterwards. This type of separator is more durable than are the treated wood separators, while the separator with ribs molded integrally is still more durable.

Hard rubber jars as used in this country are formed over mandrels and vulcanized while still on the mandrels. The jars are not put into molds, but are simply wrapped with a layer of tin on the outside. The rubber manufacturer is frequently asked if this wrapping could not be dispensed with, thereby decreasing the cost of manufacture. The tin, however, is not a great item of expense, because it can be used over and over again. It serves to hold the jar in shape during the vulcanizing process, and offers a convenient means for branding, for it is only necessary to make the impression with a die, and that is held by the tin in the compound while the jar is being vulcanized. Without the tin the jar would have a rough instead of a fairly smooth and well polished surface, dimensions could not be so well controlled, and the expense of straightening the jars after vulcanization would just about offset the cost of using the tin.

THICKNESS OF JAR WALLS.

The thickness of wall required for a hard rubber jar in automobile work in order to give the proper service, depends upon the quality of rubber used. Walls $\frac{1}{8}$ inch thick are now fairly standard for starting and lighting work. Walls $\frac{3}{32}$ inch thick are sufficient, provided the rubber compound is good enough. In fact, $\frac{1}{16}$ inch thickness of wall, if only the finest grade of materials were used, might be satisfactory, but so thin a wall is not recommended because such thin material is difficult to handle satisfactorily in the manufacture of a jar, and the percentage of defective jars is too great.

There is a tendency on the part of some battery manufacturers to use walls $\frac{3}{32}$ inch thick in the smaller batteries for the smaller and cheaper cars. While the weight per cell of the elements is, of course, smaller for a smaller battery, these batteries are usually used on small cars where the spring suspension relieves the ordinary strains upon a hard rubber jar to a less extent. To give the same service, the hard rubber jar for the small battery should have as thick a wall as in a large battery.

JAR BREAKAGE CAUSED BY ASSEMBLING.

A great deal of the breakage of hard rubber jars in service has been due not to the quality of the jar, but to the way it was assembled. If the wooden boxes are not square and fairly rigid, the bottom of the jar is frequently only partly supported. This is also true where the sealing compound is not distributed uniformly over the bottom of the battery box. In such cases a jar even of good quality will break either at the bottom or in the wall at the point where the top of the bottom rib joins the wall.

PHYSICAL AND ELECTRICAL PROPERTIES.

Many battery and rubber manufacturers have been inclined to talk loosely about tensile strength, elongation and dielectric strength. Statements in this connection mean practically nothing unless all the test conditions are known. To say that a hard rubber jar has a tensile strength of 3,600 pounds or more, does not necessarily mean that it is a serviceable jar. The tensile strength of a jar will vary according to the temperature of the test piece at the time the test is made. The usual temperature is 70 degrees F. At a lower temperature a piece of hard rubber

ber of a given composition and hardness will have a higher, and a piece at a higher temperature, a lower tensile strength.

A tensile test will vary as much as 25 per cent, according to the type of machine upon which the test is made. The faster the pull, the greater will be the tensile strength as indicated by the machine. To insure anything like accurate results, a motor-driven test machine should be used.

Furthermore, the tensile test will vary according to the amount the piece has been vulcanized. A compound that has been vulcanized until it is very hard will have a much higher tensile strength than the same compound vulcanized less. A jar with high tensile strength is usually too hard and brittle to give satisfactory service.

The results of elongation tests will vary according to the shape of the test piece, its temperature and the amount it has been vulcanized. The slower the speed of the test machine, and the higher the temperature, the greater will be the elongation. The harder the compound is vulcanized the smaller will be the elongation. The distance between the jaws of the test machine is usually taken as the basis of elongation tests. If the test piece is of uniform cross section, the percentage of elongation will be lower than if the test piece is of the usual shape, that is, small at the center and large at the ends. There is also the slippage in the jaws to contend with if the distance between the jaws is taken as the basis. To insure accurate elongation tests, the basis should really be the distance between two given points on a piece of uniform cross section.

The electrical test on a hard rubber jar is usually made by placing it on a mandrel inside a frame, the mandrel and frame being respectively the positive and negative poles. The results here will vary according to whether the current used is alternating or direct, the length of time during which the current is applied, and, in the case of alternating current, its frequency.

RIGID SPECIFICATIONS REQUIRED.

When battery manufacturers adopt specifications for hard rubber goods, there is an inclination to make them too rigid. Jars may be rejected that would really be more serviceable than many that might pass the test. A certain specification might call for a tensile strength of 3,600 pounds and an elongation of 3 per cent. A jar might have a much larger percentage of rubber than would be necessary to meet these specifications if it were cured to the degree of hardness necessary to meet them, or might happen to be slightly under-vulcanized so that it would have a tensile strength of only 2,500 pounds or an elongation of as much as 10 per cent. Such a jar, although rejected, would be more serviceable than a jar that would just meet the specifications.

It will be well to add a word of caution regarding the so-called flexible jars. Any rubber manufacturer can furnish a hard rubber jar that is flexible when it is new by simply making it from the compounds used in the manufacture of a rigid jar, but vulcanizing it for a shorter length of time or at a lower temperature. Such jars were put into service as many as seven or eight years ago, but their use was discontinued. They were flexible, and almost unbreakable when new, but were more easily affected by the acid than the ordinary rigid jar, and hardened up rapidly with age and from the effect of the acid, to the point where they were more brittle than if they had been vulcanized to the usual degree of hardness in the first place.

With flexible jars, therefore, the problem is to furnish a jar low enough in price to be used in a commercial way that will not become brittle too rapidly with age, and that will not harden so as to make it unserviceable. Whether any given jar meets these requirements is something that can be determined only by actual service for the ordinary life of a battery.

Hard rubber parts as they are now used in automobiles vary greatly in designs and sizes, and it is necessary that the hard rubber manufacturer have an enormous investment in special equipment. Costs could be materially reduced if these parts were standardized. There is already considerable standardization of hard rubber parts as used by railroads, and while in automobile construction standardization would not be carried to the same point, there is no reason why it could not be carried further than at the present time.

DISCUSSION.

R. J. Nightingale, sales manager, Willard Storage Battery Co., Cleveland, Ohio, then said: "We have been in the test on hard rubber storage battery jars exclusively, not so much to test the quality of the jar as to find the defects in workmanship. It has been our experience that the greater percentage of leaky jars was caused by breakage in transit to us from the jar manufacturers or failure of the jar where the workman had rolled the seams. The high voltage test does find defective seams and breaks, as well as thin spots in the walls of the jars.

WHY WOOD SEPARATORS ARE USED

"We have been told by the speaker that, because of their cost, storage battery manufacturers do not use rubber separators. This is not a fact. Wood separators are used in preference to wooden and rubber sheets, or all rubber separators, because the cell is of higher internal resistance with the rubber sheet or rubber separators. If we were to construct a starting battery with wooden separators and rubber sheets, it would be necessary for the car manufacturer in order to maintain the same voltage characteristics at the lower temperatures, to purchase a battery of 50 per cent greater capacity than is the one he now has in which only wooden separators are used."

S. A. E. ELECTRICAL VEHICLE DIVISION CONSIDERS BATTERY-JAR DIMENSIONS.

A meeting of the electric vehicle division was held on February 25 in the offices of the Society of Automobile Engineers, 29 West Thirty-ninth street, New York City. Aside from members of the division and the standards committee staff, there were present representatives of five of the leading storage battery manufacturers.

The chief work of the meeting was in regard to dimensions of storage battery jars, as a preliminary to standardizing dimensions of trays to facilitate the interchange of batteries.

The work of the meeting was tentative, and has not been formally approved by the division. The suggested dimensions were as follows:

Heights, high-rig jars.....	13 3/4 inches.
low-rig jars.....	12 7/16 inches.
Width	6 1/2 inches.
Thickness of walls	3/8 inch.

No conclusion was reached as to the length, which is variable, depending upon the number and thickness of plates. This problem was discussed at length, and plans were formulated for a tabulation of present practice to be submitted in an attempt to arrive at a reasonable list of standard lengths. This tabulation has now been prepared by a member of the division. It shows forty-five variations in the length between 2 and 8 1/2 inches. It is suggested that the list be reduced to 27 lengths with 2 1/4-inch sediment space, and to 15 lengths with 1 1/4-inch sediment space.

The division is thus making real progress toward a standard which promises to be of great value to the electric vehicle industry.

Another matter before the division is a revision of the present standards for charging receptacles consisting in a lengthening of the sleeve and insulating members.

S. A. E. ADOPTS STANDARDS RELATING TO RUBBER.

At a meeting of the Society of Automobile Engineers held in New York City, January 5-6, recommendations for new and revised standards were made. Those on insulated wire and cable, rubber hose and clamps, industrial truck tires and solid tire diameters were published in detail in THE INDIA RUBBER WORLD, February 1, 1916. These recommendations have now been adopted in their entirety by the letter ballot of the voting members, which was closed on March 6.

A PILLOW VENTILATOR.

A pillow full of light, fresh feathers affords an exceedingly comfortable head-rest, but the feathers are apt to become heavy and matted owing to lack of ventilation. A device designed to afford the necessary inlet of air consists of a small spool-like ventilator made of rubber, with holes at each end. In use several of these are sewed in each end of the pillow ticking. [The H. O. Canfield Co., Bridgeport, Connecticut.]



Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

Foreign Import Duties on Boots and Shoes.

THE following table, corrected to April 1, 1916, shows the foreign import duties on rubber boots and shoes of all descriptions, imported into the various countries from the United States.

Owing to the frequency of tariff changes the figures and information given in this table should be periodically verified. It is also advised that small trial shipments be made in order to

test the rates prior to sending more extensive shipments.

In the first column is given the country, while the next column contains the articles with notes regarding surtaxes, basis of rates, etc. The third column specifies whether the weight is to be taken as gross or net and the last column gives the ad valorem duty and the rate of specific duty in United States currency.

Countries.	Articles and Remarks.	Weight.	Duty (U. S. Currency).
EUROPE:			
Austria-Hungary	Shoemakers' wares, with textile goods, per 100 pounds	Net	\$1.23
Belgium	Manufactures of india rubber, ad valorem	Net	10%
Bulgaria	Ordinary rubber boots and shoes (galoshes), per 100 pounds (includes 20 per cent surtax)	Net	\$10.53
	Other rubber boots and shoes, per 100 pounds (includes 20 per cent surtax)	Net	\$21.06
Denmark	Rubber boots and shoes, with textiles, per 100 pounds—including inner packing	Net	\$6.09
France	Rubber footwear lined with felt, wool or any partly woolen cloth, per 100 pounds	Net	\$13.13
	Rubber footwear lined with cotton, hemp or flax cloth, per 100 pounds	Net	\$10.51
	Footwear with soles of rubber, per pair	Net	\$0.14
Germany	Footwear, with or without rubber soles—Unvarnished, per 100 pounds	Net	\$7.57
	Varnished, per 100 pounds	Net	\$10.82
Great Britain	Manufactures of rubber		Free
Greece	Galoshes of rubber, per 100 pounds	Net	\$59.50
Italy	Rubber footwear, lined or trimmed with stuffs, per 100 pairs	Net	\$24.13
	Rubber footwear, per 100 pounds	Net	\$4.39
Netherlands	Rubber footwear, ad valorem	Net	5%
Norway	Rubber footwear, per 100 pounds	Net	\$12.18
Portugal	Rubber footwear, per 100 pounds	Net	\$20.73
Roumania	Rubber footwear, per 100 pounds	Net	\$10.53
Russia	Rubber footwear, per 100 pounds	Net	\$26.35
Serbia	Rubber footwear, per 100 pounds	Net	\$12.28
Spain	Rubber footwear, per 100 pounds	Net	\$26.32
Sweden	Rubber footwear, per 100 pounds	Net	\$12.18
Switzerland	Rubber footwear, per 100 pounds	Gross	\$26.32
Turkey	Articles of india rubber and gutta percha, ad valorem		30%
NORTH AMERICA:			
Canada and Nova Scotia	Rubber boots and shoes, ad valorem		32½%
	Boots, shoes, slippers, tennis shoes and modes of any material not specified, ad valorem		37½%
	Imports of articles invoiced at prices less than the market value in the country from which exported, are liable to a "dumping" duty of 5 per cent if such articles are also made in Canada		
Newfoundland	Footwear and all manufactures in part or in whole of india rubber or gutta percha, ad valorem, including 10 per cent surtax		44%
SOUTH AMERICA:			
Argentina	Rubber footwear—including surtax of 2%—duty based on valuation of \$54.79 per 100 pounds	Gross	40.8%
	Footwear of cloth and rubber, whose sole measures 25 cent. (10.24 inches) or less, duty based on valuation of \$3.00 per dozen, includes surtax of 2 per cent		40.8%
	Same footwear, larger sizes, duty based on valuation of \$7.00 per dozen, includes surtax of 2 per cent		40.8%
Bolivia	Rubber footwear for men, surtax of 15 per cent is included, based on valuation of \$36.00 per dozen pairs		46.75%
	Rubber footwear for women and children: Overshoes, rubbers, boots, lined or not, including surtax of 15 per cent, based on valuation of \$1.55 per pound		46%
	Footwear for women and children with exterior lining with or without interior lining, including surtax of 15 per cent, based on valuation of \$2.27 per pound		46%
Brazil	Rubber footwear—based on value of milreis as \$0.245—per 100 pounds		\$5.18
	Rubber goods, combined with tissues of cotton, wool or linen, based on value of milreis as \$0.245 per 100 pounds		\$12.07
Chile	Footwear of any material, for sports, based on valuation of \$3.63 per pound		40%
	Shoes or overshoes, top boots, boots or tips of rubber, with or without interior lining or exterior part of wool or other material, finished or not, for the rain-shoe on valuation of \$1.815 per pound		30%
Ecuador	Rubber footwear, including surtax of 125.5 per cent, per 100 pounds	Net	\$29.83
Paraguay	Rubber footwear, based on valuation of \$54.79 per 100 pounds including weight of container	Gross	55%
	Other footwear (same as for Argentina)	Gross	55%
Peru	Rubber footwear, including weight of inner packing, at ports of Callao, Salaverry, Paita and Pisco, surtax of 10 per cent	Gross	\$31.90
	At other ports—surtax of 8 per cent	Gross	\$31.32
Uruguay	Rubber footwear, based on valuation of \$5.17 per dozen pairs—surtax of 14 per cent included		54.7%
Venezuela	Rubber footwear, including surtax of 56.55 per cent	Gross	\$34.30
ASIA:			
China	Rubber boots, per dozen pairs	Net	\$4.88
	Rubber shoes, per dozen pairs	Net	\$1.22
Japan	Rubber boots, per 100 pounds	Net	\$18.82
	Rubber shoes, per 100 pounds	Net	\$21.79
	Rubber galoshes, per 100 pounds	Net	\$19.43
OCEANIA:			
Australia	Galoshes, rubber sand boots and shoes and pilmolls, ad valorem		30%
	Golfing and walking boots, ad valorem		30%
New Zealand	Rubber footwear, ad valorem		33½%
AFRICA:			
South Africa	Rubber footwear, ad valorem		20%
	With a minimum per pair of		
	Men's		\$0.18
	Women's		\$0.12
	Children		\$0.06

RUBBER SOLES AND HEELS IN THE BRITISH SHOE INDUSTRY.

RECENTLY quite a number of samples of rubber soles, heels, tips, etc., have been brought before my notice from different manufacturers for inspection. The majority of these rubber soles and heels are of the cheap grades for use in the manufacture of cheap footwear. The majority of heels used in making cheap footwear are of the "cushion type," which has a small piece of leather, cut the same shape as the cushion, but smaller, attached inside the rim or edge of the cushion.

The following data gives some idea of the quality of the heels, soles and studs used in the cheap footwear factories.

No. 1 is for red seat studs about $\frac{1}{2}$ inch in height by $\frac{3}{4}$ inch in diameter.

	Per cent.
Old door mats, pram tyres, sag tyres	100
Raw rubber	4
Cellulose	4
Sulphur	5
Preparation	10
Whiting	4
Red substitute	3
Red oxide	5
Red Vulcanite	4
	100

No. 2 is that of a grey mixing used in heels:

30	parts prams and mats, etc.
1	part raw rubber.
2	parts sulphur.
2	parts preparation.
1	part white substitute.
2½	parts whiting.

No. 3 is that of a mixing without any new rubber at all:

30	parts prams and mats.
2	parts sulphur.
5	parts preparation.
2½	parts whiting.
1	part white substitute.

No. 4 was also a grey mixing used for cushion heels.

30	parts prams and mats.
1	part raw rubber.
½	part golf ball shells.
2½	parts sulphur.
5	parts preparation.
2	parts whiting.
1	part white substitute.

No. 5 was found to be the best of a series of poor samples of rubber soles, and consisted of a grey mixing as follows:

15	parts prams and mats.
1½	parts raw rubber.
½	part golf ball shells.
2	parts sulphur.
3½	parts preparation.
2	parts whiting.
½	part white substitute.

The reader will no doubt have come to the conclusion by the time he has perused these mixings that the shoe trade can be catered for by a low grade of rubber commodities indeed. The mixings were prepared by grinding the old door mats, perambulator tires, etc., and passing the resulting mass through a fine riddle, and then mixing with an equal weight of tar. These mixings gave constant trouble when they were applied to the shoe, as they were very crumbly, and when the operator at the stitching machine tried to sew the heel or sole to the boot the groove made by the rubber manufacturer in the mold all broke out when the needle passed through.

Shoe manufacturers, of course, cannot expect to get superior quality goods at the price they pay.

[The foregoing contributed to "The India Rubber Journal," by Fred Ashworth, a well-known English analyst and consulting chemist, is interesting as throwing a side light on one of the old-time prejudices of rubber manufacturers, in favor of ground vulcanized scrap in the place of reclaimed scrap. It can be used, of course, and if a binder like tar is added, it may be sheeted and molded, but it would be a better product if the old pram tires, codd rings, etc., were put through an adequate reclaiming process before use.—Editor.]

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered, nevertheless, they are of interest, not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

[161.] A correspondent wishes to know where he can purchase white castor oil substitute and black Russian substitute.

[162.] Prices and samples of "Vulcoline" have been requested.

[163.] Addresses of concerns making apparatus for the condensation of naphtha vapors are requested.

[164.] An export inquiry for 2,200 pounds of commercial gutta percha tissue, such as used by tailors, has been received.

[165.] An inquiry comes from Holland for machinery for making imitation rubber tiling.

[166.] A manufacturer wants to know where he can secure rubberized mummy silk.

[167.] Names of American manufacturers of gutta percha tissue are desired.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

An East African firm desires to receive catalogs, price lists and full information from American manufacturers of rubber-type printing sets. Report No. 20,553.

Communication with American manufacturers of rubber shoes and arctics is desired by a firm in Norway. Report No. 20,640.

An Italian concern would like to be placed in touch with American manufacturers of erasers of all kinds. Report No. 20,658.

An inquirer in Norway desires to be placed in touch with American manufacturers of brown, blue and black waterproof cloth for raincoats. Report No. 20,728.

A Swiss firm wishes to communicate with American manufacturers of hygienic rubber goods. Report No. 20,730.

Representation is desired in Central America for American manufacturers of suspenders, garters, raincoats, rubber overshoes and other articles. Report No. 20,772.

An applicant in Spain wishes to receive catalogs and full information from American manufacturers of rubber goods. Report No. 20,774.

A Norwegian import firm would like to be placed in touch with American manufacturers of rubbers and arctics. This firm is prepared to give an immediate order for from 100,000 to 200,000 pairs and desires the agency for the whole of Norway. Report No. 20,831.

Quotations are desired by a Swiss firm from American manufacturers of rubber gloves for acid, electrical and medical purposes, rubber-lined canvas hose, high-pressure hose for pneumatic tools, vacuum-brake hose, garden and steam hose, gas tubing, beer tubing, rubber matting, fishing trousers and stockings, galoshes and rubber boots. Report No. 20,851.

"KANTLEEK" SEAMLESS WATER BOTTLE.

A hot water bottle is a source of comfort and healing in many human ailments, and a corresponding source of discomfort and distress if it leaks. The cemented seams of the usual type of water bottle are apt in time to open up or split, with a consequent leakage that, however small, renders them unfit for use.

As will be seen in the accompanying illustration, the "Kantleek" seamless water bottle is molded in practically one piece of rubber. The rubber is claimed to be of exceptional quality, and the bag is guaranteed for two years. [The Seamless Rubber Co., New Haven, Connecticut.]



What the Rubber Chemists Are Doing.

A SERIES of researches on the synthesis, structure and vulcanization of caoutchouc has been carried out by I. I. Ostromyslenski. Abstracts follow from the "Journal of the Society of Chemical Industry" (March 31):

NEW METHOD OF COLD VULCANIZATION.

A mixture of a primary or secondary aliphatic amine with a metallic oxide either accelerates vulcanization of natural and synthetic caoutchoucs or considerably lowers the temperature of vulcanization. In the presence of such mixtures, vulcanization takes place at the ordinary temperature. The process is especially rapid with chemically pure caoutchouc obtained synthetically. In the air or ordinary molds the vulcanization occupies from a few weeks up to three months, according to the purity of the original caoutchouc. With natural caoutchoucs the vulcanization requires from two to six months at the ordinary temperature.

Vulcanization by means of trinitrobenzene or benzoyl peroxide also takes place at ordinary temperature, no special catalyst being necessary. Oxides of zinc, magnesium, and particularly lead accelerate the action when the nitro-compound is used, but these oxides retard cold vulcanization by benzoyl peroxide and also diminish the value of the vulcanized material. When trinitrobenzene is used, time is saved by preliminary heating of the mixture at 122 to 140 degrees F., or by preparing it with hot rolls. Rolling with benzoyl peroxide must be carried out at the ordinary temperature, otherwise a sticky mass results. Cautious heating of the mixed mass at 86 to 176 degrees F., for 10 to 40 seconds is also necessary in this case, but access of air must be avoided.

ACTION OF AMINES AND METALLIC OXIDES ON THE VULCANIZATION OF CAOUTCHOU.

In a mixture of caoutchouc, sulphur, amine and metallic oxide, the sulphur and the amine first react with formation of the corresponding thiozonide. This reaction proceeds only in the presence of a catalyst such as an oxide. The unstable thiozonide then transmits its sulphur to the caoutchouc, the amine being regenerated, or the aminic residue, under the influence of the oxide, uniting with a fresh portion of sulphur to give thiozonide. The process is one of double catalysis. The metallic oxide catalyses the formation of the thiozonide of the amine, which in turn accelerates the formation of the caoutchouc thiozonide and so catalyses the vulcanization. Only primary and secondary amines give thiozonides and these are also the only amines which catalyse the vulcanization of caoutchouc. Thiozonides of aromatic amines are relatively stable compounds, incapable of functioning as sulphur carriers. An explanation is thus afforded of the observation that aromatic amines have practically no catalytic action on the vulcanization of caoutchouc.

From Bernstein's observation that the ordinary vulcanization of caoutchouc proceeds at the ordinary temperature under the action of ultra-violet light, it is concluded that, in the absence of air, this light activates sulphur by converting it into thiozone. The vulcanization is then effected partly by the latter and partly by the ozone formed simultaneously. Thiozone is also formed when ordinary sulphur is dissolved in a primary or secondary aliphatic amine, such as piperidine with a side chain, and the solution either heated for 20 to 50 minutes with lead oxide in a reflux apparatus on a water bath, or left at the room temperature.

VULCANIZATION OF CAOUTCHOUIC BY HALOGEN COMPOUNDS.

In the formation of vulcanite-like substances by the action of bromine, iodine or iodine bromide on caoutchouc, the first phase of the change consists in the formation of the caoutchouc halogenide. The unchanged caoutchouc then absorbs this new com-

pound or forms a swollen mass with it. This process may also be carried out by treatment of the caoutchouc with its halogenide. The latter acts either freshly prepared or old. All three halogenides of either natural or synthetic caoutchouc may be employed. Caouprene chloride or bromide exert a similar action on caoutchouc. The products obtained from the chloride are especially valuable because of their great stability and relatively low elastic point, and are easily obtained chemically pure. The amount of caoutchouc used need not exceed 7 to 10 parts per 100 parts of caouprene chloride. Similar vulcanization is effected by the action of the hydrochloride of natural caoutchouc, but not by that of aluminum chloride. The products obtained by the above methods have the black color of ordinary ebonite, are electrical non-conductors, may be scratched with the nail, keep well even in moist air, and take a high polish.

NATURAL GAS AND SYNTHETIC RUBBER.

In recent investigations by Singer, natural gas below the freezing point was subjected to successive pressures, according to "Le Caoutchouc & la Gutta-Percha." The first compression, of 3½ atmospheres, yielded liquids having a density of 0.6935 to 0.6720; and those of the second compression, of 24 atmospheres, showed a specific weight of 0.6365 to 0.6160.

The first part contained 30 per cent of pentane, 30 per cent of hexane and 7 per cent of butane. The second part was composed of ethane, propane and hexane, and appeared to be similar to the gas oil studied by Colson.

These products may serve as low cost material for transformation into isoprene or butadiene.

METHODS OF ANALYSIS.

ANALYSIS OF VULCANIZED RUBBER GOODS.

THE following scheme for analysis is reported by J. A. S. Morrison of Glastonbury, England:

The usual estimations are: rubber resins, free sulphur, mineral matter, vulcanized rubber and rubber substitutes.

RUBBER RESINS.—Rasp the sample into small pieces; weigh out 4 grams and extract with acetone in a Soxhlet extractor for two days. Dry the extract at 212 degrees F. and weigh. This extract contains the rubber resins and free sulphur, the latter being estimated in the extract as described later. The total extract minus the free sulphur gives the rubber resins. Keep the residue from the extraction in order to determine the rubber substitutes.

MINERAL MATTER.—To determine the mineral matter, 1 or 2 grams of the sample are boiled with 50 cc. of nitrobenzene in a fat flask with air reflux. It is then cooled and washed into a 300 cc. tall beaker with a mixture of 2 vols. sulphuric ether and 1 vol. ethyl alcohol. Dilute to about 250 cc. with this mixture, stir and stand over night to settle. Viscous deposits are due to insufficient ether, and more should be added if these occur. Filter the insoluble matter on a tared filter, dry and weigh. This gives organic matter insoluble in nitrobenzene plus mineral matter.

Wash the tared filter with warm dilute hydrochloric acid. Wash out acid with water, dry and weigh. Finally ash the paper and residue and weigh ash. Ash plus loss due to hydrochloric acid washing gives total mineral matter. The extraction with hydrochloric acid is carried out in order to extract carbonates as such.

The difference between the total nitrobenzene residue on the tared filter and the total mineral matter gives the organic matter insoluble in nitrobenzene. Carbon if used as a filling will be included in this figure.

FREE SULPHUR.—Take acetone extract (rubber resins) in a fat flask, moisten with water and cautiously add 25 cc. fuming nitric acid, cooling the flask in ice. Then gently warm and finally digest on steam bath, using a funnel as cover. When action is complete wash into a porcelain dish with a few cc. of fuming nitric acid and evaporate off all the acid. All the sulphur is now converted into sulphuric acid. Intimately mix the mass with 5 grams of a mixture of 3 parts sodium carbonate and 2 parts potassium nitrate; moisten slightly with water and mix well. Cover with a large dish and heat over a low flame till white. Cool and take up with concentrated hydrochloric acid, evaporate to dryness twice to precipitate silica and then finally dissolve in dilute hydrochloric acid, filter and precipitate as barium sulphate. Calculate to sulphur. This gives the figure for free sulphur.

RUBBER SUBSTITUTES (OXIDIZED OIL, ETC.).—The residue from the acetone extraction in the determination of rubber resins is digested with 100 cc. approximately half normal alcoholic potash for 4 hours at 140 to 158 degrees F. Pour off through a filter and digest residue twice with warm alcohol. Mix filtrate and alcoholic washings and evaporate off nearly all the alcohol. Take up the residue in a little cold water, transfer to a separating funnel, acidify and remove the fatty acids with ether. Ether extract is then taken to dryness and weighed. This gives fatty acids of oxidized oils, and is taken as the percentage of rubber substitutes.

VULCANIZED RUBBER.—This is obtained by subtracting the sum of the other determinations from 100.

TOTAL SULPHUR.—The method is the same as that described under free sulphur only one uses the original rasped rubber. The difference between total and free sulphur gives combined sulphur, but as this is included in vulcanized rubber, it is seldom separately expressed.

FREE SULPHUR IN RUBBER INSULATION.

The method for determining free sulphur in vulcanized rubber insulation as developed by Emile Baldeschwieler is as follows:

The weight of the finely divided sample varies, but generally 2 grams is sufficient. It is extracted for 8 to 10 hours in a Soxhlet apparatus with acetone at 131 degrees F. The apparatus is then disconnected, the excess of solvent evaporated, and the flask dried at 131 to 140 degrees F. Fuming nitric acid to the amount of 60 cc. is then added to the residue in the flask, which is covered with a watch glass, and contents boiled gently until most of the red fumes have been expelled.

The flask is then uncovered and a small pinch of potassium chlorate added to the boiling liquid. Continue the addition of small amounts of potassium chlorate until the liquid is entirely clear. When the greenish color has disappeared, remove the flame and cool the flask in ice water. If properly conducted the operations will yield a clear liquid with white flakes or a lump of paraffin floating on top.

This is separated by filtration and the filtrate, evaporated nearly to dryness, is taken up with hydrochloric acid. The operation is repeated several times to drive off the nitric acid. Dissolve the residue in water, add 1 cc. dilute hydrochloric acid and filter into a 500 cc. beaker. Make up to 400 cc. with water, heat to boiling and add, drop by drop, a slight excess of a 10 per cent solution of barium chloride. Filter and weigh as barium sulphate.

DIRECT DETERMINATION OF RUBBER IN VULCANIZED RUBBER GOODS.

A combustion method for the direct determination of rubber in vulcanized rubber goods has been developed by Robert W. Belfit. It is simple, quick and accurate for high grade compounds and preferable to those direct methods which depend upon the formation of compounds, the exact formulae of which are not constant or controllable.

The author states that his method is at present restricted to positively high grade stocks, which do not contain lampblack, reclaimed rubber or rubber substitutes. The method gives the

percentage of rubber too high in the presence of ground leather, egg albumen or other organic compounds insoluble in acetone, water and dilute hydrochloric acid.

In detail the procedure is as follows:

The sample is ground so that it will all pass through a 20-mesh sieve while but 20 per cent passes through a 40-mesh sieve. Then, 2 grams are extracted in a weighed tube for 5 hours with acetone kept continually at the boiling point. The tube containing the residue is inserted in an oven, kept at 212 degrees F., and a current of dry carbon dioxide is passed through the tube in order to aid rapid drying and prevent oxidation. The dried sample is weighed, and the percentage loss in weight calculated. About one-half of this extracted sample is weighed into a 250 cc. Erlenmeyer flask, and is cautiously boiled for 30 minutes with 150 cc. of hydrochloric acid (1 to 5 by volume). In this process all carbonates are driven off.

The liquid is decanted through an alundum crucible and the residue is washed three times by decantation with water at about 140 degrees F., then washed ten more times with warm water. The residue is now placed in a tube and dried in a stream of dry carbon dioxide at 212 degrees F. for two to four hours. The tube is then removed and cooled in a desiccator.

This dry residue is next transferred to a weighing tube, from which 0.3-gram samples are weighed for combustion. The combustion is carried out in approximately the same manner as for any organic compound, except that no reduced copper spiral is used, as the water and nitrogen oxides are absorbed in a concentrated solution of potassium dichromate in sulphuric acid. A vessel of small volume is necessary for this solution, or otherwise it is almost impossible to displace all of the carbon dioxide after the sample has been completely burned. Beyond this tube is placed a U-tube containing zinc dust to absorb all possible acid gases other than carbon dioxide. The potassium hydroxide absorption bulb is next and last in the train. The rubber substance is burned in a stream of oxygen, and the potash bulb is always weighed when full of oxygen.

This method on pure, fine Para gum gave 96.16 and 96.57 per cent.

The value 0.96 is taken as the figure by which the weight of caoutchouc should be divided in order to obtain the weight of the rubber from which it came.

HASTENING EVAPORATION.

A piece of black tin tubing is made into a coil, which is put into a water bath, and to one end is attached a rubber tube connecting to a source of air. To the other end is attached a tubing connected to a right-angle glass tube, and which is passed through a stopper held in a clamp on a ring stand. By raising and lowering the clamp the distance of the air outlet from the surface of filtrate can be regulated. B. Freeman, of Clemson College, South Carolina, states that the heated air in the coil will hasten evaporation 50 per cent.

SCHOLARSHIP IN CHEMICAL ENGINEERING.

The Chemists' Club of New York City announces the establishment of a scholarship fund, the income from which, approximately \$500 per year, is to be devoted to assisting financially deserving young men to obtain education in the field of industrial chemistry or chemical engineering. This scholarship has been endowed by Dr. Victor G. Bloede, a prominent manufacturing chemist of Baltimore. Its benefits will be open to properly qualified applicants without restriction as to residence, and may be effective at any institution in the United States, which may be designated or approved by the Chemists' Club.

All inquiries should be addressed to the Bloede scholarship committee of the Chemists' Club, 50 East 41st street, New York City. Applications for the academic year 1916-1917 should be in the hands of the committee on or before June 1, 1916.

CHEMICAL TREATMENT OF RUBBER.

THE UNITED STATES.

DEVULCANIZING RUBBER. No. 1,178,483. Samuel E. Allen, assignor to the Empire Rubber Co.—The process of devulcanizing rubber by subjecting it to a bath having a boiling point above 392 degrees F., and containing oil derived by distillation from pine wood.

PRODUCING CAOUTCHOUC SUBSTANCES. No. 1,178,721. Fritz Hofmann; Konrad Delbruck and Kurt Meisenburg, assignors to Farbenfabriken Vorm. Friedr. Bayer & Co., Elberfeld, Germany.—The process of producing a composite caoutchouc substance which comprises mixing a hydrocarbon of the butadiene series with about an equal amount of caoutchouc and polymerizing the hydrocarbon in such mixture to give a composite caoutchouc substance.

UNITED KINGDOM.

ARTIFICIAL LEATHER. No. 100,038 (1916). N. G. Scheuer, Copenhagen.—Artificial leather is made by impregnating linen duck with linseed oil or a varnish to which a little siccatif and Vienna red have been added, drying and sticking the sheets together with a mixture of 4 kilos heated wood tar pitch, 2 kilos india rubber dissolved in benzene or the like, 4 kilos Vienna red mixed to thick consistency with French turpentine, and 2 kilos of powdered cork. The compound sheet is finally passed through pressure rollers.

CANADA.

VULCANIZING PROCESS. No. 167,203. Paul I. Murrill, assignor to the Canadian Consolidated Rubber Co., Limited. Same as United States patent No. 1,166,777. *THE INDIA RUBBER WORLD*, February, 1916.

VULCANIZATION ACCELERATOR. No. 167,204. Paul I. Murrill, assignor to the Canadian Consolidated Rubber Co., Limited. Bone oil is added as an accelerator of the vulcanizing agent.

THE FRENCH REPUBLIC.

RECLAIMING RUBBER FROM TIRE FABRICS. No. 478,280. C. De Villiers. The process consists in treating the rubber-coated waste fabric with boiling hot tetrachloride of ethane in two stages. The free sulphur is removed by a brief treatment, the solution of the rubber is accomplished by a second extraction with fresh solvent.

SPONGY RUBBER. No. 478,369. P. Schidrowitz and H. A. Goldsborough. Coagulating rubber latex under conditions producing a porous or spongy coagulum and fixing the pores by vulcanization. (*THE INDIA RUBBER WORLD*, July, 1915.)

THE GERMAN EMPIRE.

WATERPROOF FABRICS. No. 285,138 (1912). The material to be waterproofed is treated with hydrocarbons yielding synthetic gums by known process of polymerization. The result is a more uniform impregnation with gum than is possible with the use of gum solutions.

"BALATA" FROM NORTHERN NIGERIA.

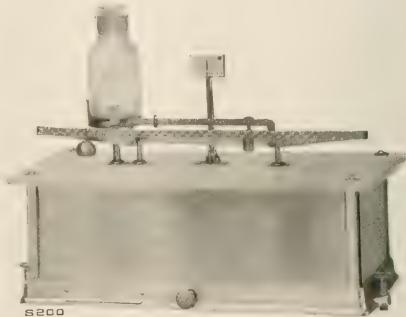
The Imperial Institute has examined a sample of "balata" rubber from northern Nigeria. It contained considerable moisture and vegetable impurities; was white to red in color; tenacious; only slightly elastic and very sticky. The sample lost 26 per cent impurities by washing. Analysis of the residue showed 49.2 per cent caoutchouc, 47.4 per cent resin, 2.4 per cent protein and 0.7 per cent ash.

The caoutchouc when isolated was almost black and showed inferior physical properties. The "balata" rubber of northern Nigeria is probably derived from *Ficus vogelii*, the preceding data being in accord with the analyses, made by the Imperial Institute, of samples of the product obtained from this tree in Gambia and the Gold Coast.

LABORATORY APPARATUS.

LIQUID SPECIFIC GRAVITY BALANCE.

A SPECIAL torsion balance has been perfected, designed especially for readily determining the specific gravities of liquids. The results are obtained direct from the reading of the beam without the use of loose weights or calculations. The scale



is adapted for specific gravities from 0.7000 to 1.4000, and is accurate to the fourth decimal place.

The operation of the scale is extremely simple. The bottle is filled with the liquid, wiped thoroughly clean on the outside and placed upon the scale. Balance is secured by means of the slide weights, and the result read from the beam. [Christian Becker, New York City.]

BURETTE ATTACHMENT.

A simple attachment to a stop-cock burette enables the operator to control perfectly the flow of reagent during titration.

The discharge may be regulated from a series of drops to a fraction of a drop, as may be required at the end of reaction, when too much may spoil the work of hours.

The device does not interfere with the ordinary use of the burette. It consists of an arm attachable to the stop-cock and an adjustable stop arranged around the burette. [E. P. Curtis, New York City.]



ANOTHER SYNTHETIC RUBBER SCHEME.

A writ of attachment against the property of Knut C. Widdeen, of Brooklyn, New York, has been issued to recover \$31,200 advanced to him by the backers of his alleged synthetic rubber scheme. It is alleged that Widdeen claimed he had a process for making synthetic rubber at a cost of 15 cents a pound, and that a demonstration was given in Brooklyn, where a big vat was shown containing some sticky substance which Widdeen described as rubber made by his process. The proposition was to form a company to be called the Northern Rubber Corporation, with a capital of \$100,000, later to be increased, Widdeen claiming that it would be easy to make 10,000,000 pounds of rubber per year, and offering the plaintiffs 51 per cent of the capital stock for \$31,200. The plaintiffs, Kuno B. Heberlein and Franz Rosenberg, put up the money, and finding the business lagging, hunted for Widdeen only to discover that he had gone south and had left no word as to the date of his return.

New Machines and Appliances.

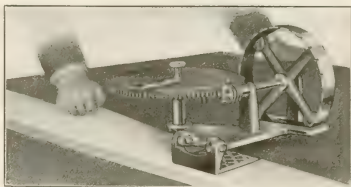
AUTOMATIC ELECTRICAL CONTROL FOR CALENDERS.

THE illustration shows the installation of an up-to-date automatic electrical calender control equipment, where the calender is used for various classes of work, such as frictioning, skim coating and sheeting tire stock. Each of the above operations is performed at different speeds, and in order to maintain a uniform quality of material it is necessary that the speeds of the rolls during the various processes should be constant.

Therefore a direct current adjustable speed motor is preferable for a calender drive. This type of control is fully automatic. It consists of three parts, the main panel, on which is mounted the operating contactors; the master panel, on which is mounted the field rheostat for speed control with 70 points to insure close speed adjustment, and a push button station, mounted on the side of the calender, from which the control is operated.

From this station the motor may be started, stopped, or slowed down without stopping for threading in. After once

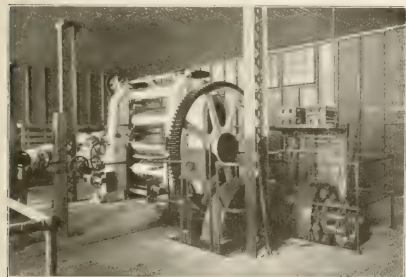
The measuring wheel is three-quarters of a yard in circumference and rests directly upon the cloth, while it is prevented from slipping by minute pins in the rim. Should these pins



result in injury to the cloth, the measuring wheel can be covered with felt, leather or plush. [Parks & Woolson Machine Co., Springfield, Vermont.]

A NEW INNER TUBE SPICE VULCANIZER.

The Allen air-cooled vulcanizer is one of the newest devices for curing the joint of inner tubes. It consists of a two-part hinged cylinder cored for steam, and provided with heat radiating flanges. It is supported on standards for convenient operation from a bench or table. There are two handles for opening the vulcanizer, and a swinging bolt operated by a socket wrench for tightening the two halves together. The inside of the cylinder is bored to exact size of the inner tube. The ends, however, are closed and act as clamps, limiting the air to the confined part of the tube. An opening is provided in the lower section of the vulcanizer to accommodate the valve stem. The tube is skived, cemented and placed in the steam-heated cylinder, which is then closed, locked, and the part of the tube within the vulcanizer is inflated against the walls of the cylinder. When the cure is complete the steam is shut off, and after the vul-



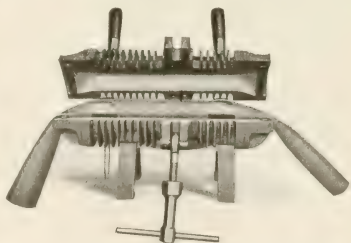
setting the master controller for any desired speed, the operator can either slow down to the threading speed or stop and then start up again and return to the same speed without readjustment of the control.

The master field rheostat is provided with a dial stamped in yards per minute, so that the operator always knows the yardage at which he is running. The equipment also provides dynamic braking for quick stopping. The control illustrated is used with a 90-horse-power, 300 to 900 revolutions per minute, 230-volt motor driving a 24 x 66-inch 3-roll Farrell calender. [General Electric Co., Schenectady, New York.]

STANDARD CLOTH MEASURER.

The extremely simple and low cost cloth measure machine shown in the illustration can be used to measure almost any fabric or rubber-covered goods. It is not designed for handling a large and continuous output, but is well adapted for inventory taking or where small yardage is measured daily or large yardage occasionally.

The cloth is simply pulled through by hand and, as the measuring wheel is turned, the measurement of the cloth is registered on the dial. The entire measuring mechanism is mounted on a hinged plate so the cloth can be easily introduced. An automatic lock is provided to stop the measuring dial when the cloth leaves the wheel. The pointer is set to zero by operating the thumb screw in the center of the dial.



cylinder cools down, which is greatly facilitated by the heat radiating flanges, the tube is removed from the cylinder. [Allen Machine Co., Erie, Pennsylvania.]

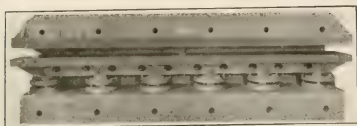
SOUTHWARK 250-TON GOOSE NECK TIRE BEAD PRESS.

A six-cylinder tire bead press of the goose neck type is the subject of the accompanying illustration. It is designed according to the demands of modern tire practice for quality of work and maximum production.

The cast iron housing is heavily built and ribbed to withstand without deflection the full pressure of 250 tons when applied by the powerful rams. The cast steel ram cylinders are rigidly

supported in the base of the housings and the six hydraulic rams operate in perfect unison in raising and lowering the steam platen. This is 24 inches wide and 16 feet long, chambered for steam and attached so that the expansion due to the heat is provided for. The top platen is of the same dimensions, similarly constructed and attached to the upper part of the housing.

While this press is used for forming and curing tire beads,



it is equally serviceable in vulcanizing hose, matting and belting. [Southwark Foundry & Machine Co., Philadelphia, Pennsylvania.]

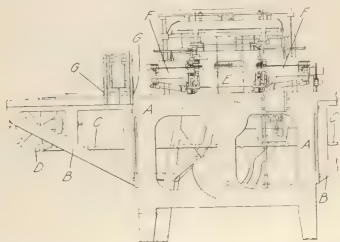
MACHINERY PATENTS.

THE WINKLEY SOLE CUTTING MACHINE.

THE machine illustrated in the drawing is specially designed to automatically cut shoe soles from sheets of rubber stock and to impress thereon the medallions which usually appear near the middle of the sole.

The frame of the machine is designated by *A*, while *B* are the extensions supporting the moving work table *C*, on which the cutting is done. This table is composed of thin, flat plates pivoted together, forming an endless carrier that is driven by the sprocket wheel *D*. The sheets of rubber stock are placed upon the table by the operator, and as they are advanced into position to register with the cutters they are operated upon by pressure rollers which press them uniformly and evenly upon the surface of the table.

The two cutting mechanisms *F*, *F*, which are mounted over this table, are driven by independent gearing, cams and levers operated from the main shaft. Each cutting mechanism comprises a form or pattern corresponding in outline to the sole to be cut, a cutter carrying head, and feeding and controlling mechanism which causes the cutter to travel in a path corre-



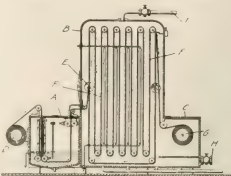
sponding to the outline of the pattern. Each cutter is operated and controlled independently of the other, and as each cutter finishes cutting a sole its operating and controlling mechanism is thrown out of operation. When both cutters have finished their operation the heads are raised to disengage the cutters from the stock, and mechanism for moving forward the table to present a new portion of the stock to the cutters is thrown into action. As the shifting movement of the table is completed the medallion impressing mechanism *G*, *G*, is operated to impress one or more medallions upon the cut soles. [Erastus E. Winkley, Lynn, Massachusetts. United States patent No. 1,177,577.]

APPARATUS FOR IMPREGNATING TIRE FABRICS.

Kremer's invention relates to a process and mechanical apparatus for impregnating cotton fabrics with rubber or other materials suitable in the preparation of fabrics for use in the manufacture of tire casings. A vertical section of the apparatus

is shown in the illustration in which *A* is the solution tank, *B* the drying chamber and *C* the compartment where the saturated fabric is wound up on a roller.

In operation the fabric is fed from the roll *D* into the rubber solution, where the air is removed by a pair of



rollers that also force the solution into the interstices of the cloth. As it passes out of the tank the excess rubber is removed by another pair of rollers.

The fabric (which is attached to the cross bar *E*) is then drawn through the drying chamber by the endless chain belt *F*, driven by a series of sprocket wheels, and is wound up on the roller *G*. Hot air is introduced to the drying chamber through valve *H*, and circulation is maintained through pipe *I* located at the top of the chamber. The condensed solvent is drawn off through a pipe provided for that purpose at the bottom of the chamber. [F. W. Kremer, Carlstadt, New Jersey. United States patent No. 1,174,995.]

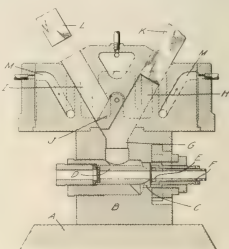
COVERING HOSE WITH LEAD PRIOR TO VULCANIZING.

This machine is primarily adapted for forming a tube of lead around rubber hose to perform the services of a mold during the process of vulcanization. It may also be used with other machines for making metallic tubes, without regard to whether such tubing is formed around rubber hose or a tube of other character.

Referring to the illustration, *A* is the base of the machine that supports the block *B*, provided with a die chamber *C* in which the die *D* is supported by a threaded sleeve. The forward end of this die cooperates with the female die *E* supported in the die carrier *F*.

The molten metal is discharged into the passage *G* from the supply chambers *H* and *I*. The block *J* swings on a pivot and automatically closes the chamber *I* when pressure is applied by the plunger *K* to the molten metal in chamber *H*. When pressure is applied to the metal in chamber *I*, the opposite chamber is closed by the swinging block *J* and the metal from chamber *I* is discharged into the passage *G*. From here the metal is forced through the dies *D* and *E* which encase the hose in a tube of lead as it passes through the openings provided for it in the dies.

In order to partially cool the molten metal and head block, the latter is provided with angular chambers *M*, *M*, through which water is caused to flow. [C. D. Garretson, Wilmington, Delaware, assignor to Electric Hose & Rubber Co., Wilmington, Delaware. United States patent No. 1,177,097.]



"Rubber Machinery," by Henry C. Pearson—should be in the library of every rubber manufacturer and factory superintendent.

PNEUMATIC TIRE VULCANIZING BAG.

This invention relates to annular fluid pressure bags which are employed in vulcanizing certain types of pneumatic tire casings, such as cord tires, to hold them in an expanded condition while being cured. Referring to the illustration, *A* is an annular moldable bag made of fractured fabric, suitably reinforced and thickened at the base or inner wall by extra plies of fabric. The shield *B* is composed of the same materials and is attached by its inner margin to the base of the bag, forming a continuous annular flap. This is prevented from adhering to the bag during vulcanization by dusting the surfaces with talc.

Afterwards the collapsed bag is inserted in the casing *C*, the head ring *D* is applied and the tire placed in the vulcanizing mold *E*. The bag is then inflated by fluid pressure applied through the tube *F*, transmitting uniform pressure through the shield flap to all adjacent parts of the inner tire wall. Thus ridges in the latter are avoided, and at the same time the shield acts as a protector against possible overheating of the vulcanizing bag. [J. J. Johnson, Jr., and J. R. Gammett, both of Akron, Ohio, assignors to The B. F. Goodrich Co. of New York City. United States patent No. 1,177,112.]

PACKING CUTTER.—Square or round packing can be accurately cut at the desired angle by this machine, producing smooth, perfect fitting ends. [R. A. Landry, Houston Heights, Texas. United States patent No. 1,176,838.]

PNEUMATIC TIRE MOLD.—It is a two-part annular mold with interchangeable tread forming rings and inside and outside rings for aligning the mold parts. Pressure is applied to the interior of the tire by a water inflated bag. [G. E. Battcheller, New York City. United States patent No. 1,175,681.]

BRITISH AND FRENCH PATENTS.

ELASTIC FABRICS. In making fabric for surgical elastic hosiery, rubber threads covered with ordinary cotton thread are arranged in pairs forming the warp, while non-elastic threads are used as the filler, thereby producing an open mesh elastic fabric. [A. F. Porter, 12 Aldersgate street, London, England. British patent No. 23,561 (1914).]

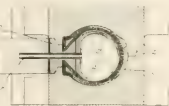
AEROPLANE WHEEL AND RIM. The object of this invention is to permit rapid mounting and de-mounting of tires having wired or inextensible beads, yet prevent lateral displacement of the tire when fitted to the rim. [Dunlop Rubber Co., Limited, 14 Regent street, London, and Colin Macbeth, Aston Cross, Birmingham, England. British patent No. 2,638 (1915).]

OVERFLOW TRIMMING MACHINE.—This invention comprises a rotary cutter operating in conjunction with an adjustable table and a lever for holding the material in contact with the cutter. [Edwin Harrison, Brook College, Leyland, Preston, England. British patent No. 5,218 (1915).]

EMBOSSED SHOE CALENDER WITH INTERCHANGEABLE DESIGN SLEEVES.—The embossing roller is removable and is provided with interchangeable sleeves bearing the engraved designs and patterns desired to be impressed on the rubber. [Charles Woollett, 176 Rice Lane, Walton, Liverpool, England. British patent No. 4,019 (1915).]

EXPANDING VULCANIZING MOLD.—In making linings for pneumatic tires an expandable body of zinc provides for the expansion of the mold parts when heated. [T. Sloper, Southgate Devises, Wiltshire, England. British patent No. 22,995 (1916).]

METHOD OF MAKING TIRE CASINGS.—The outer covers of pneumatic tires are generally built up with fabrics coated with a rubber solution, and cut bias at an angle of about 45 degrees. The inventor inserts between the superimposed canvas layers a woven fabric cut bias. This fabric is coated and equally elastic in both directions, viz., in the plane of the wheel and in the direction perpendicular to the said plane. Its intended purpose is



to provide equal resistance in both directions. [M. Laroche. French patent No. 47,825 (July 25, 1914).]

MACHINE FOR MAKING INLAID OR MOSAIC WORK.—The material which forms the foundation or backing for the inlaid work, is supported by rollers which communicate to it a forward movement. A series of mechanically controlled "die" rollers arranged above the supporting rollers, cuts out the pieces forming the mosaic which are ejected and placed on the foundation to which they are firmly attached, forming the design. [E. T. Fenwick. French patent No. 478,210 (March 31, 1915).]

OTHER MACHINERY PATENTS.

THE UNITED STATES.

- 1,176,666. Sawing machine. J. H. Reed, assignor to the Holt & D. A. Sutherland Co., 1131 N. Main.
- 1,176,686. Water treating machine. T. Midgley, Worthington, Ohio.
- 1,176,688. Method for making and curing rubber shoes. W. R. Demaree, assignor to Miles Rubber Co., both of Akron, Ohio.
- 1,177,007. The engine, used for building tire casings. J. E. Thompson, and J. T. S. Rubber Co., both of Elyria, Ohio.
- 1,177,755. Collapsible core. A. Adamson, Akron, Ohio.
- 1,177,756. Collapsible core. A. Adamson, Akron, Ohio.
- 1,177,835. Mold for making rubber heels. J. E. Telford, assignor to The T. S. Rubber Co., both of Elyria, Ohio.
- 1,178,005. Machine device for turning machines. G. F. Desner, Plainfield, N. J., assignor to Morgan & Wright, Detroit, Mich.
- 1,178,024. Tire making machine. J. E. Thompson, and J. E. Thompson, and A. de la Bast, all of Weehawken, assignors to The de la Bast and Thorpe Circular Woven Tire Co., Trenton—both in New Jersey.
- 1,179,033. Method of and apparatus for reinforcing inflatable tire tubes. J. H. Poole, assignor to Reinforced Inner Tube Co., both of Brockton, Mass.
- 1,179,077. Machine for forming rubber tubes and the like. E. S. Currier, Beach 41, Ohio.
- 1,179,200. Means for splicing inflatable tubes. D. Lowe, East Akron, Ohio.

THE UNITED KINGDOM.

- 22,490 (1914). Machine for masticating, cleaning or washing rubber. S. C. Davidson, Success, Lanchester Works, Belfast.
- 23,212 (1914). Making compounds and tubes. L. A. Subers, Marion building, 1270 West Third street, Cleveland, Ohio.
- 23,313 (1914). Making hose or compound fabrics. L. A. Subers, Marion building, 1270 West Third street, Cleveland, Ohio.
- 33,224 (1914). Making laminated fabric bands. L. A. Subers, Marion building, 1270 West Third street, Cleveland, Ohio.
- 43,590 (1914). Molding tires. W. Reid, 8 Albert Drive, Pollokshields, and J. Stungo, 157 St. Vincent street—both in Glasgow.

THE DOMINION OF CANADA.

- 167,119. Vacuum rubber machine. The Rubber Regenerating Co., Nantux, Ont., Canada, assignor to R. B. Price, New York City. (See *Pat. Exch. Review*, Vol. 12, December, 1915, page 121.)

NEW MANUFACTURING PROCESSES.

PRESSURE CURE.—Rubber articles, hose tubes and the like are subjected to vulcanizing heat and external fluid pressure in a closed chamber, then a cooling liquid is admitted to the chamber while the goods are under pressure. [John M. Brier, assignor to Boston Woven Hose & Rubber Co., Cambridge, Massachusetts. United States patent No. 1,177,678.]

INNER TUBE MADE OF GUT.—The interior or exterior of the gut is impregnated with rubber or a similar solution which improves its resiliency as well as increasing its impermeability to air. These inner tubes can be made with or without seams, in one piece or in several parts, according to the size desired, and are intended for automobile, motorcycle and bicycle tires. The tube is provided with a valve through which air or any other material can be forced into it. [Wilhelm Pook, Marienthalerstrasse 126, Hamburg, Germany. German patent No. 640,924.]

OTHER PROCESS PATENTS.

THE UNITED STATES.

- 1,177,024. Hose construction combining an inner casing with an outer fluid conveying tube and a reinforcing fabric. R. M. King, Oak Park, Ill.

THE UNITED KINGDOM.

- 23,069 (1914). Linoleum fabric for cotton tire hoses. W. J. Mellish-Jackson, 35 Southampton Buildings, London.
- 23,222 (1914). Compound fabrics. L. A. Subers, 1270 West Third street, Cleveland, Ohio.
- 33,224 (1914). Compound fabrics. L. A. Subers, 1270 West Third street, Cleveland, Ohio.
- 43,590 (1914). Compound fabrics. L. A. Subers, 1270 West Third street, Cleveland, Ohio.

THE FRENCH REPUBLIC.

- PATENT ISSUED (With Date of Application).
- 478,511 July 25, 1914. Construction of a machine for manufacturing tires. M. Laroche.

THE EDITOR'S BOOK TABLE.

STANDARDIZATION OF AUTOMOBILE TIRE FABRICS. TECHNologic Paper No. 68 of the Bureau of Standards, Washington, D. C. By Walter S. Lewis and Charles J. Cleary.

THIS pamphlet records the various steps taken by the authors in the study of the fabrics for the purpose of developing the best methods of testing 17½-ounce standard tire building fabrics. The chief causes of variations in test results were found to be due to different testing machines, size of test specimen, moisture in fabric at the time of test, method of selecting samples and differences in the fabric. Comparative tests were made to determine which of the several common methods for ascertaining each particular physical property of the fabric would give the most reliable results.

The difference in strength of the same fabric tested upon two different testing machines was often large. In one case it was 40 pounds and the strength of the fabric was about 225 pounds. Several kinds of test specimens prepared for the strength tests were carefully compared. The results indicated that a test specimen one inch wide and 3 inches long is fully as satisfactory as regards accuracy and reliability as any other dimension. The quantity of moisture in the cotton fabric has a marked influence upon the weight and strength. Methods of sampling for strength tests are, also, fully discussed and tables are given showing in detail the results of the various investigations.

THE AUTOMOBILE FUEL SITUATION. BY E. S. FOLJAMBE, Society of Automobile Engineers, New York City. (8vo, 18 pages, paper bound.)

An address on the present gasoline situation given by E. S. Foljambe, managing editor of the Chilton Co., before the Metropolitan Section of the Society of Automobile Engineers at its March 16 meeting, has been published in pamphlet form. He claims that the present high price for gasoline seriously affects the automobile industry, which already shows a falling off in demand for new machines. He quotes from the report of Secretary Lane of the Interior, who gives as the causes for the phenomenal rise in the price of gasoline, increase in consumption and in exports, causing a depletion of stock on hand, and to these are added decreased production of crude oil, rich in gasoline, and the increase in the price of crude oil from which gasoline is made. The United States Bureau of Mines places the value of petroleum wasted at not less than \$30,000,000 a year, due largely to evaporation, nearly all of which is preventable. If no new oil fields are discovered, and even if the production of casing-head gasoline from natural gas continues to increase, the author figures that the total supply will be exhausted in 15 years. Alcohol, he deems, offers no relief at present. Benzol may be used—in fact, is used in Europe as a substitute, but sells at present at a higher price than gasoline. Natural gas under pressure has proven practicable for short runs. Kerosene may come into use, but it brings problems. The engines would need to be modified and low-grade fuel carburetors must be devised. Some form of thermostat must be installed. Gasoline would be needed even then to start the engine, and perhaps a mixture of fuels of high and low volatility might be used, a combination valve being provided which would allow any proportion of each in the mixture. Several special carburetors are described and their principal merits mentioned. The suggestions as regards remedies, or measures for relief, are a tax on exports, improvement and general use of more economical distillation processes, the curtailment of waste, the development of crude oil fields, oil-bearing shales and natural gas districts.

PEEPS AT MANY LANDS. SOUTH AMERICA. EDITH A. BROWNE, F.R.G.S. A. & C. Black, Limited, London, England. [Price, 1s. 6d.]

Many of our readers know Miss Browne, whose contributions to THE INDIA RUBBER WORLD have been read with interest. She

is the author of several books, one of which, in the series of "Peeps at Industries," is devoted to the rubber industry. Miss Browne is well qualified to write on these subjects, having visited many of the countries of South America, and having been associated with A. Staines Manders, the organizer of the International Rubber Exhibitions, to whom this book is dedicated. The book is one of the "Peeps" series of small, handsomely printed, concisely written books, and this one on South America is particularly attractive, having 12 full-page illustrations, reproductions of water-color sketches. In a volume of 88 pages only a fleeting view can be had of such a large country as South America, and Miss Browne is to be congratulated on getting so much in the way of facts concisely but entertainingly told in so small a compass. One of the chapters is devoted to "Para Rubber" and another to "A Voyage Up the Amazon." But, besides these, all the principal cities are briefly described, as is also the trip on the Trans-Andine railway to the West Coast. Four other trips—across Lake Titicaca, through the Panama Canal, up the River Magdalena in a house-boat to Bogota, and to the Kaieteur Fall of the Potaro River in British Guiana, are particularly interesting.

LIST OF PARA EXPORTERS AND IMPORTERS, 1915. PUBLISHED by the Associação Commercial do Pará (Commercial Association of Pará, Brazil), in Portuguese, French and English, for free distribution. (8vo, paper cover, 104 pages.)

Giving expression to part of a program traced for itself, the Commercial Association of Pará is distributing without charge a complete list of exporters and importers established in that important trading center of Brazil.

Besides being a handy and serviceable directory this publication contains valuable information regarding Pará, its climate, its trade and banking statistics, its school for practical commerce and its commercial association.

The list of exporters opens with the names and addresses of crude rubber exporters, while the importers' list contains the names and addresses of importers of electrical instruments and apparatus, automobiles, department stores, importers of footwear, commission merchants, druggists, importers of hardware, telephones, the commercial agents and representatives of national and foreign houses, banks and exchange brokers, and a list of foreign consulates.

The book will be found valuable to all interested in commercial relations with the great trading and rubber exporting center of Northern Brazil.

NEW TRADE PUBLICATIONS.

THE March number of "Footprints," the house organ of the Canadian Consolidated Rubber Co., Limited, Montreal, Canada, is really a catalog of the many lines of footwear manufactured by that corporation. It is a handsomely printed pamphlet of 120 pages, almost every page containing one or more half-tone illustrations of the lines of footwear, which are fully described, giving all particulars so that dealers can order understandingly. Some of the pages are in color, where the goods are manufactured in other than black or gray rubber. Besides the catalog proper, there is an explanation of the standard assortment of case packings, showing the number of pairs of each size packed in a case unless ordered otherwise. There is a description of each last and outline cuts showing a side and sole view. Some pointers are given wearers on the care of rubbers and to dealers regarding fitting. The cover, printed in blue and orange, carries out the idea of the name "Footprints," the sub-title being so arranged as to simulate a footprint by the shaping and placing of the letters.

The United States Rubber Co. has been sending out to its footwear customers some attractive cut-outs to advertise their "Champion" tennis shoes. A square frame showing styles of tennis

shoes and the brands used upon them is so arranged that the "Champion" tennis cut-out boy can be so hung as to swing in this frame, balanced by his legs extending forward under the frame, the feet showing white tennis shoes with the "Champion" trade-mark upon them. The boy is an amusing little fellow who swings back and forth at every puff of wind and thereby makes an effective advertisement for this line of footwear, if hung in a window or suspended in a store. Another cut-out simulates the United States Rubber Co.'s patent pressure process "Storm King" boot, which is represented standing upon a box appropriately labeled and having at one end the newly adopted trade-mark of the company. The boot is in bright red and also shows the trade-mark on the front of the leg.

The Hyde Manufacturing Co., manufacturers of specialties in knives and cutting tools, Southbridge, Massachusetts, has issued Catalog R, this being devoted entirely to knives for rubber workers. One would hardly suppose so great a variety and number of different cutting tools are required in the rubber industry. In the thirty or more pages are pictured, described and priced several hundred knives, with points of every conceivable shape for the hand worker, square, half round, round bevel and taper point, tire knives, lathe knives, circular and machine knives. The catalog is excellently arranged and should find a place in every rubber factory.

The Peerless Rubber Manufacturing Co., New York City, sends out its catalogs in specially folded stiff paper covers, which allow a new page to be inserted where changes need to be made in the lists. Two of these catalogs relate to belting and packing, and both are handsome specimens of typography, each page being printed in two colors, the goods pictured in excellent half-tones and the description thorough in all respects. The belting booklet gives a considerable amount of information regarding the application of belting, horse power rules, pulley diameters, belt capacity, etc. Both books are likely to prove useful to the many customers of this concern.

"The Romance of Rubber" is the title of a little 24-page booklet published by The B. F. Goodrich Co., Akron, Ohio, to exploit its products. The plan of the book is to show at the top of each page a fine half-tone picture relative to the gathering or manufacture of rubber, while at the lower outside corner of each page is an appropriate picture of something relative to the gathering of rubber, or scenery in tropical countries. The text is informative, though it contains practically little that is not known to every rubber manufacturer and to most people in the rubber trade. In typography it is up to the high standard of the publications emanating from this enterprising company.

The United States Tire Co., New York City, has recently published a small vest pocket brochure that will interest the motorist who really wants to know the facts about individualized tires. The title is "Judging Tires," and it treats very pertinent questions, such as "Which type of tire will last longest on your weight of car," "Which type of tire will last longest under your road conditions," and other factors to be considered in the selection of tires.

The business of repairing pneumatic tires has become an important one and any measure which will advance the ability of repairers is one which will be truly welcome. The Goodyear Tire & Rubber Co., Akron, Ohio, has published a "Manual of Tire Repairing" which gives in condensed form, in a book of less than 50 pages, directions for repairing every sort of tire injury—cuts and punctures, breaks in fabrics, blow-outs, rim cuts, as well as splicing inner tubes, relining and retreading, vulcanizing, etc. There are given besides this a form of tag and return check for repairers, a system of accounting, and a

large number of illustrations showing the tools and machines necessary for the up-to-date repair business.

The Underwriters' Laboratories, Chicago, Illinois, whose work in connection with testing materials and appliances used in the prevention and suppression of fires is well known, has sent to all holders of its June, 1915, edition of "Standards for Rubber Covered Wires and Cables," 12 revised pages to take the place of the same number of pages in that edition. On account of the arrangement of the original edition these new pages can readily be inserted in their proper places and thereby render the book up to date. Most of the changes are explanatory, but some show changes of more or less importance. All changes are printed in italics and therefore can be easily and quickly distinguished.

The Institution of Electrical Engineers, London, England, has sent THE INDIA RUBBER WORLD a copy of "Wiring Rules" issued by that institution, with extracts from Board of Trade and Home Office regulations for factories and workshops. This, as its name indicates, is a compilation in compact form of all the rules which are required by the British Government as regards wiring factories, workshops, mines, theaters and private houses. It tells what is required for insulation, classing vulcanized rubber insulation as Class A, while hygroscopic dielectric insulation such as impregnated paper or fiber is in Class B. The pamphlet also gives the thickness of rubber insulation required, and much practical matter of interest to those having charge of installing electricity. Among other changes in this edition may be mentioned provisions made for conductors with hard-rubber-compound protection.

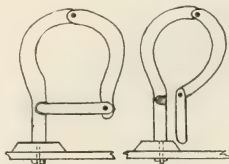
REGISTRATION OF TRADE-MARKS IN LATIN AMERICA

The American exporter or manufacturer selling goods in Latin America should protect his trade-marks. Attention should be called to the difference in the legal point of view as to the ownership of trade-marks between the Latin American countries and the United States. By the common law, use is the basis of property in a trade-mark, and registration in the United States is merely an additional means of protecting that property right acquired by use. In the Latin American countries, on the other hand, the rights of property in a trade-mark are derived entirely from the law and depend on the registration of the mark. Registration is usually granted without investigation of the right to its use, though after due notice to those interested by publication of the application in the official gazettes. When once effected, registration is final against all later comers. The importance of registration is therefore greater in the Latin American countries than in the United States, in view of the possibilities for unfair registration under the trade-mark laws in effect in those countries.

MAKING DIVING CAPS.

The diving cap is a quiet and unassuming affair compared to the ornate modern bathing cap, of which it is the prototype. Utility, rather than beauty, is aimed at in its design, but what it lacks in appearance it amply repays in efficiency, as every swimmer knows.

These are always made entirely by hand. The two pieces forming the cap are cut from a sheet of raw unvulcanized stock and the cemented seams united by a hand stitcher on the seaming form shown on the left. This form is hinged and provided with a short locking arm. When this is released the form collapses, as shown on the right, and the cap is removed and vulcanized.



New Goods and Specialties.

BATHING CAP NOVELTIES.

A TIMELY novelty in bathing caps is shown herewith, aptly named the "Aviator" because of its resemblance to the helmets worn by the drivers of air machines. The body of the cap is seamless and it is trimmed by hand. The crown

is of natural pure gum color and the head-band of combination red and black, the decorative figures being either round, as shown in the illustration, or diamond or square-shaped. The turn-down piece, tied under the chin, protects the neck, ears and hair and renders this up-to-the-minute style of bathing cap thoroughly practical as well as ornamental.

The demure effect of the national headgear of Holland is cleverly obtained in the "Dutch Cap" also shown. It is hand made, with a box-plaited crown and a tight head-band across the back. The pinked,

plaited edges becomingly frame the face, and four rosettes, two at the top and two at the back, add the further adorning touch desired by feminine wearers.

This cap is furnished in a variety of colors—"Persian," red, blue, green, wistaria, tango, silver gray and pure gum.

Another popular cap simulates the bandanna handkerchief, being made with a two-colored bow and a two-piece body; while a turban cap is ornamented with buckles and a bow in front, and still another style has a crown fashioned in one-inch box pleats and a double head-band, the ornamental effect being obtained by the contrasting color of the outside band which is held in place by loops and has a flat, tailored bow on one side.

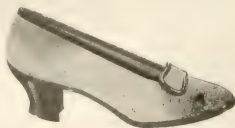
[Faultless Rubber Co., Ashland, Ohio.]

MOURNING FOOTWEAR.

It is a somewhat sad commentary on the effect of the war that in Canada there is a demand for mourning shoes. Such footwear is now made in tennis lines, several styles, with

white duck tops, cemented rubber soles, and black trimmings being designed to wear with mourning costumes. The one shown has a white duck top, edged with black, a black Cuban heel and a black rubber sole.

Another style has a colonial buckle and tongue, edged with black, with a wedge heel and sole of smooth, white rubber. A steadily increased call is noted for these goods. They are made in women's sizes only. [The Canadian Consolidated Rubber Co., Limited, Montreal, Canada.]



WET WEATHER SPORT GARMENTS.

The young woman of today goes in for athletics and stormy weather has no terrors for her. Because of this, manufacturers vie with each other in producing apparel for special wet weather wear, and two recent creations in this line are shown herewith.

One is a golf coat, exceedingly light in weight, made of rubberized silk in a handsome olive tan shade. This is so cut as to give plenty of room for the free play of the arms necessary in the various strokes of the game, and in order that such a coat shall be more comfortable it is ventilated under the arms, thus allowing for the circulation of air between the coat and the clothing



of the wearer. With this a mannish hat of shower-proof gabardine is worn, and this, with a cravenetted skirt, or one of rubberized silk, completes the costume for the up-to-date player who wishes to go round the links in real Scotch golfing weather.

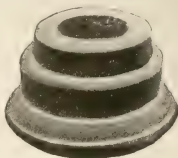
The other picture shows a female devotee of Izaak Walton, with her cravenetted thorn-tweed skirt and knickerbockers, Storm King rubber boots and leather coat. Thus appared, she can defy the spray of the ocean or can wade through brooks in pursuit of her finny victims. These garments will commend themselves to up-to-date sporting goods and clothing dealers. [Abercrombie & Fitch, New York City.]



THE DURST ANTI-SPASHER.

The unusual feature of this accessory to the kitchen sink consists in the body of the anti-spasher being made entirely of rubber.

There is no metal sleeve to foul or rust and the threads that permit quick and easy attachment to the faucet are molded in the rubber body. The only metal in this device is the small tin-plated disk that forms the strainer that is located inside the body and protected by a rubber washer. Moreover, this anti-spasher and strainer also offers protection to the dishes and other breakable ware that through carelessness are broken by the unprotected metal faucet. [Durst Manufacturing Co., New York City.]



WATERPROOF PROTECTING TOWEL AND BATHING CAP.

The practical and convenient hair drying towel here shown is made of rubber and therefore affords complete protection while drying the hair after bathing or a shampoo. Or it may be used



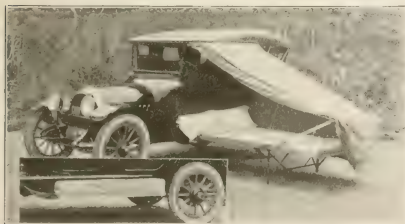
to keep the hair from the wet bathing suit, as shown in the illustration. This rubber towel is made up in a soft, peach-blow color, which should make it very attractive to feminine buyers. It has a narrow black band around the neck and is securely fastened in front by means of a collar button. A similar style of hair drying accessory is edged with rubber fringe.

The rubber cap also shown is a novelty "College" bathing cap. The under part fits closely over the hair as do ordinary bathing caps, while

the top is stiffened to simulate the customary headgear of the college girl, a pendant tassel completing the resemblance. [L. C. Studios, New York City.]

AUTOMOBILE CAMP BED AND TENT.

There is an element of the nomad in many people. The get-back-to-nature desire is predominant in many minds. Gypsy life, with its freedom, has charms for thousands of urbanites. The automobile makes one independent of railroads, but not of hotels. Those who would carry their beds with them, and camp out where night overtakes them, will be interested in accompanying pictures showing an auto-touring sleeping device, a bed which



folds up in so small a space as to be readily transportable on the running board of the car, yet which when set up provides a comfortable bed for two people.

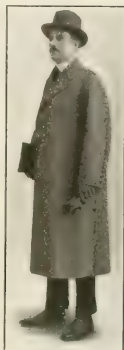
It is argued that the average collapsible cot sags to the middle, and is therefore uncomfortable for two sleepers. It is claimed this objection is overcome in this collapsible bed by producing a flexible spring mattress that will fold or roll into very small space, yet will not sag. The frame is of metal-capped wooden bars swiveled to the running-board, and a tent of heavy army khaki protects the sleepers. This gives the whole tonneau as a dressing room from which the tourists can step at once into the bed.

When collapsed the bed and tent roll into a compact space, as

shown in the other illustration. [L. F. Schilling Co., St. Joseph, Missouri.]

DOUBLE TEXTURE SLIP-ON

There is an amount of style put into waterproof and weatherproof garments nowadays which commends them to a much larger circle of wearers than in the old days when such garments were less artistically cut and less handsomely finished. A glance at this picture of a 1916 slip-on will confirm this statement. It is made with a convertible collar, thus fulfilling its mission for rainy weather and yet rolling back at the lapels much the same as a regular overcoat. It is made 48 inches long rather than the usual slip-on length, which gives it a more stylish appearance. This coat is of double texture material, the goods being of fine quality and made up in a number of weaves of popular mixed fabrics, and linings of vari-colored plaids. The cutting and making are on a par with fine clothing lines and the result is a line of garments which will commend themselves to fine dressers. [C. Kenyon Co., New York City.]

**PNEUMATIC RUBBER HEEL.**

One objection to full heel tennis shoes is the weight of the solid rubber heel. A heel which, besides obviating the heavy weight of a solid block of rubber, is so constructed as to allow pneumatic action, thereby adding to its resiliency, is well shown in the accompanying illustration. This heel is hollow, but has in it three longitudinal partitions which add to its rigidity while forming a number of compartments or air cushions. The partitions mentioned have vents, one to another, as has also the breast of the heel, so that the air can escape from each chamber slowly. It is claimed that this makes a better wearing heel than one of solid rubber, besides having the added advantages of lightness and resiliency. [Hood Rubber Co., Watertown, Massachusetts.]

**"THERMOID" GASOLINE HOSE**

Gasoline hose of inferior grade is an actual menace to life and property, and extended experimentation has resulted in a superior hose for garage equipment in which the rubber compounds used are warranted to resist the action of gasoline to an unusual extent.

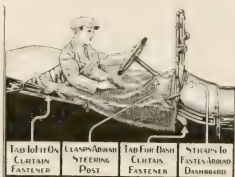


The "Thermoid" gasoline hose has been tested and approved by the Underwriters' Laboratories, Inc., and the quality and construction are examined and tested by them at regular intervals. This hose is made with either three or four plies of high-grade duck, the tube being lined with one-ply duck, which is reinforced and held in place by a flat, coiled steel wire. The wire-wound hose is machine wound with a very hard steel wire, which will not unwind if cut at any point and will not flatten under ordinary weight; yet the hose is very flexible and will not kink. [Thermoid Rubber Co., Trenton, New Jersey.]



"FRONT-SEAT" AUTO ROBE.

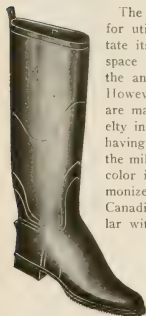
The new features of this auto robe, as indicated in the illustration, are the specially designed fastenings for attachment to the dashboard at the bottom of the windshield and to the sides of the car, and the special flap which fits around the steering wheel post. This robe will fit all automobiles, is quickly adjusted and detached, and not only keeps the cold out, but the heat of the engine in as well. It is made of black or green plush, lined with rubber and khaki cloth; also with heavy cloth lining and reversible, to fit right or left hand drive. [Automobile Apparel Co., Port Chester, New York.]



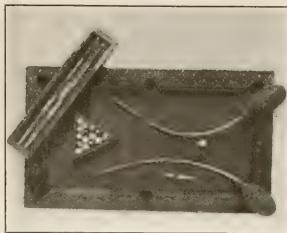
Fastenings for CURTAIN, STEERING POST, and CURTAIN, FASTENER, STRAPS IN FRONT, AND DASHBOARD.

A TAN MILITARY RUBBER BOOT.

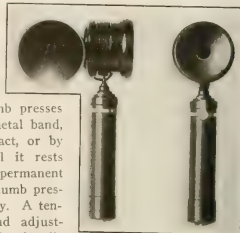
The standard rubber boot is designed mainly for utility, and its shape is such as to facilitate its easy drawing on and removal. Extra space is therefore allowed at the back, above the ankle, giving a rather clumsy appearance. However, close fitting and very shapely styles are made for military wear, and a recent novelty in this line is one in tan or brown rubber having the trim, straight lines which distinguish the military officers' leather footwear. This new color in the military boot is designed to harmonize with the modern field costume of the Canadian troops, and it has become very popular with the volunteers who have gone across the water to do their share in the fighting for the mother country. This boot is made only in men's sizes. [Miner Rubber Co., Limited, Montreal, Canada.]

**PNEUMATIC CUE FOR POOL.**

A novel use of a rubber bulb is for the propulsion of miniature ivory pool balls upon a small pool table, in all dimensions proportionate to the full sized tables. Any shot which is possible on a regular sized table can be made on this. The cues, instead of being used to strike the white ball, are tubular, and connected with rubber bulbs, the force of the compressed air making the stroke. It is evident that this calls for a special degree of skill to manipulate the ball, which thus places this form of pool-playing in a class by itself. The table is of mahogany, the rubber cushions are silk covered, and all the appointments are of fine quality and in excellent taste, comparing most favorably with those of the regulation size table. [F. A. O. Schwarz, New York City.]

**LOGNETTE ELECTRIC EAR-PHONE.**

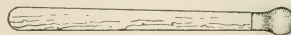
The ear-phone shown in the right illustration is made complete in itself, the electric battery being contained in the handle, eliminating the cords and trappings customary in devices for the use of deaf persons. The transmitter is made of hard rubber. By means of a small metal switch at the top of the handle, the electric current is turned on or off at will, thus avoiding any waste of electricity. A slight touch of the thumb presses the switch against the metal band, effecting temporary contact, or by moving the switch until it rests upon a metal projection, permanent contact is secured and thumb pressure rendered unnecessary. A tone regulator for sound adjustment at the base of the handle controls the electric current and makes it possible to regulate the tone according to the preference or requirements of the individual. The battery is of the type used in all flash-lights, and therefore can be readily renewed in any city or town.



A similar model with the additional attachment of a megaphone concentrator on the transmitter is also shown. This concentrator, which is made of hard rubber, focuses the sound waves direct to the instrument. Both these instruments are guaranteed by the manufacturer for a period of ten years. [Globe Ear-Phone Co., New York City.]

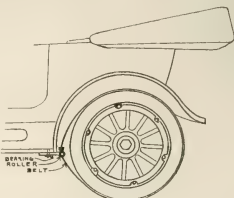
ICE PACKER WITH RUBBER BULB.

An improvement on the ordinary method of packing ice is shown herewith. The use of a stick to pack the ice between the coils of the ice chamber has frequently proved an expensive operation, owing to the breaking of the coils. The soft, white rubber bulb, of tough quality, and special shape and construction, at the end of this ice puncher prevents such accidents. Attached to a long handle, it affords a convenient and safe implement for packing ice. [The Schaefer Rubber Co., Cincinnati, Ohio.]

**A NON-SKID TRACTION BELT.**

A traction belt which the inventor claims will do the work of tire chains and more, has been developed by a Californian and tried out on both pleasure and commercial cars. It was designed at first to make traction in sand and was given its first tests in the unimproved roads of Arizona, where the loose, yielding surface makes it difficult for an ordinary tire to get a grip.

The endless balata gum belt is two inches wider, and considerably larger in diameter than the tire which it encircles. It travels over an idler roller, which revolves in bearings attached to the running board and keeps it in traction with the tire. In the illustration the device is shown ready for use. To remove the belt the outer bearing cap is unscrewed and the idler roller drawn out, leaving the belt free to be removed from the tire.



The Obituary Record.

PRESIDENT ALLIANCE RUBBER CO.

GEORGE C. RUSSELL, president and treasurer of the Alliance Rubber Co., Alliance, Ohio, died on March 30 at Los Angeles, California, having gone there in an endeavor to recuperate from an operation for cancer of the liver, to which he had submitted several months previous. Mr. Russell was born August 30, 1872, at Lockland, Ohio. He was at one time general manager of the Elliott-Fisher Typewriting Co., having his office in New York City. From there he went to the McCaskey Register Co., of Alliance, and in March, 1913, with Milton Bejach, who was also connected with the McCaskey company, he formed the Alliance Rubber Co., of which he was the president and treasurer, and started manufacturing molded specialties. Mr. Russell was a very energetic business man and interested in other manufacturing concerns in Alliance. He was also an enthusiastic collector of antiques and works of art, many of which he had gathered from all corners of the earth. He was twice married, and is survived by his second wife, who was Mrs. Ruby Jones McNair, of Newark, Ohio, and three children.

EXPLORED THE AMAZON.

Colin Mackenzie, whose explorations on the Amazon River were of material help to such men as Huber and others in botanical research in rubber lines, died in New York City on

April 10 at the age of 79 years. He was born in Glasgow, Scotland, and once ran for Parliament against Lord James Bryce, former ambassador to this country, but was defeated. He explored and mapped out regions along the Amazon River, where he engaged in the rubber business. When he came to this country he settled in California, where he was naturalized. Mr. Mackenzie later became a resident of New York City, where at one time he was reputed to be the



COLIN MACKENZIE

largest importer of coffee from South America. His Amazon experiences gave him a membership in the Royal Geographical Society, the Explorers' Club, and other scientific bodies. At the time of his death he was auditor of the Legal Aid Society, of New York City.

TWENTY-SIX YEARS AT WOONSOCKET RUBBER CO.

William Oswald Park, for seven years city clerk of Woonsocket, Rhode Island, and formerly mayor of that city, died recently of Bright's disease. Mr. Park was born in Roxbury, Massachusetts, December 28, 1863; was educated in the Boston public schools and moved to Woonsocket 33 years ago, entering the accounting department of the Woonsocket Rubber Co.,

of which plant his cousin, the late John F. Holt, was superintendent. Mr. Park remained with this company for 26 years, rising to the position of head office man and holding that position until he was elected city clerk in 1909. He was prominent in politics, having occupied the offices of councilman, alderman, mayor, clerk of the police commission, and city clerk. The last two offices he held at the time of his death. Mr. Park was also prominently identified with the Masons, the Woonsocket Business Men's Association and the Universalist Men's Club.

A PROMINENT CEMENT MANUFACTURER.

George David Hazen of the Hazen-Brown Co., manufacturer of rubber cement, died at his home in Brockton, Massachusetts, April 13, as the result of a long illness and a recent surgical operation. Mr. Hazen was born in Dixon, Illinois, nearly 50 years ago. His education in the public schools was supplemented by extensive reading and study. He was for several years employed as a chemist by Eugene Arnstein, Chicago, Illinois, manufacturer of cements, and about 10 years ago with Max Brown, who, until then, had been a salesman with the same concern, formed the Hazen-Brown Co., starting in a small shop in Brockton. As the business grew the factory has been repeatedly enlarged and branch offices were established in a number of manufacturing centers where the goods were in large demand. Mr. Hazen had long been a student and an investigator, and was an expert chemist. He took an active interest in politics, was a director in the Morris Plan Bank of Brockton, a member of the Commercial Club, Economic Club, Chamber of Commerce and Association of Superintendents and Foremen. He was an enthusiastic fisherman and knew well the best fishing places all over New England. He is survived by a widow and two daughters.

THIRTY-THREE YEARS WITH ONE CONCERN.

Edwin Wesley Deane, connected with the J. W. Buckley Rubber Co., New York City, for about 33 years, died recently at his home in Brooklyn, New York, aged 49 years. Mr. Deane came to the Buckley company from school, growing up in the rubber business. In 1910, when the concern was incorporated Mr. Deane was given an interest in the business and elected secretary of the company. He was well known to all the rubber trade and especially liked for his courteous treatment of every one with whom he came in contact. Mr. Deane was an example of a worthy, industrious and competent man, and his loss will be greatly felt, not only by his immediate associates but by many in the mechanical rubber trade. He was affiliated with high Masonic bodies, Royal Arcanum and Loyal Association. He is survived by a wife and daughter.

BUILT UP A LARGE WASTE BUSINESS.

Abraham Oppenheimer, senior member of the firm of Oppenheimer & Co., waste material and scrap rubber dealers, Buffalo, New York, died March 6 at his residence in that city. He was born in a small village in Messen, Darmstadt, Germany, in 1841, coming to America at the age of 14. He began his business career at Nunda, New York, removing to Westfield and then to Buffalo in 1871, where he built up an extensive business. He was a thirty-second degree Mason, a member of the Shrine and of the Acacia Club, and was an ex-president of Beth Temple of Buffalo. He leaves a widow, three daughters and two sons, Nathan and Walter, who were associated with him in business.

PIONEER IN RUBBER STAMP BUSINESS.

George Kissam Cooke, the first man to manufacture rubber stamps in England, died at his home at Jamaica, Long Island, March 30, aged 72 years. Mr. Cooke was born in Hartford, Connecticut, and was a great grandson of Oliver W. Cooke, one of the founders of Yale University. He served in the Civil War, and, being a man of much ingenuity, invented a number of simple devices which ultimately brought him a large competence. Regarding the rubber hand stamp, it is stated that he learned the process in New York and went to London about the year 1872, establishing the business of G. K. Cooke, Hurls & Co., at 170 Fleet street, London, E. C., and in 1873 he took out a British patent for a dry heat process.

Mr. Cooke spent several years in traveling in European countries, and of late years has lived at the Kissam homestead, Kissam Place, Jamaica, New York. He is survived by a widow and two sons.

INSULATED WIRE SPECIALIST.

Charles Warren Bassett, who established the insulated wire department of the Washburn & Moen Manufacturing Co., Worcester, Massachusetts, 25 years ago, died at his home in that city March 31, aged 72 years. Mr. Bassett was considered an expert in his line, and managed the sales division of that department after the absorption of the Washburn & Moen plant by the American Steel & Wire Co. He was born in East Braintree, Massachusetts, and previous to assuming the above position was in business in Boston. He leaves a widow and two daughters.

FORMERLY WITH THE INDIA RUBBER WORLD.

James W. Burke, for some years connected with THE INDIA RUBBER WORLD, died on March 30 at Christ Hospital, Jersey City, New Jersey, of arterial trouble and pneumonia. Mr. Burke was born in Dublin, Ireland, December 13, 1847, and although he had but a meager school education, he studied under his father's guidance and became so well versed in several languages as to have been awarded prizes in German and French. At the age of 14 he entered the service of the Spanish consul in London, England. Two years later he went to Murdoch's Nephews, London, who later sent him to New York to open a branch office here. He was in their service for 36 years. On the death of the head of this firm he was successively with Doull Miller Co. and the National Association of Manufacturers, New York City. From there he came to THE INDIA RUBBER WORLD in 1911, where he did excellent work in the statistical and foreign correspondence departments, retiring because of ill health in November, 1914, this being his last business connection. Mr. Burke was a careful and efficient worker in his chosen departments, and a valued member of the staff of this journal. He was a musician of marked ability, both instrumental and vocal. He leaves a widow and three children, besides six children by a former marriage.

A WELL-KNOWN ENGLISH MANUFACTURER.

The death is reported of William McLean Henderson, managing director of the Ancots Vale Rubber Co., Manchester, England. He went from Scotland about 40 years ago to this work, leaving to join, for some years, Broadhurst & Co., rubber manufacturers, a mile or so away, and afterwards returning to the Ancots company as whip hand, at a time when its affairs were not in an altogether satisfactory condition. The present condition of the works and business is eloquent testimony to the business acumen of the deceased. Mr. Henderson was chairman of the India Rubber Manufacturers' Association in 1908.

HEAD OF A PROMINENT SCOTCH RUBBER COMPANY.

Lieutenant-Colonel David C. Campbell, V. D., of Messrs. Campbell, Achnach & Co., Thistle Rubber Mills Co., Glasgow, Scotland, died March 8 at his residence in that city, aged 57

years. Colonel Campbell had been connected with the rubber industry practically all his business life, becoming, with his brother, proprietor of the Thistle Rubber Mills in Glasgow in 1905, and on the death of his brother the following year, he became sole proprietor of the business, which was formed into a limited liability company in 1915, he being senior director and chairman of the new organization. Colonel Campbell was a man of genial and courteous disposition and had a wide circle of friends throughout the trade who respected him for his business ability and sterling integrity.

HAD MANY FRIENDS IN THE EAST.

William Johnstone, lieutenant of the Royal Highlanders (Black Watch) and brother of J. T. Johnstone of J. T. Johnstone & Co., crude rubber importers and dealers, New York and Akron, was recently killed in France. Mr. Johnstone was born, April 21, 1888, in Birkenhead, England, educated in English private schools, and later came to America where he attended the Newark High School at Newark, New Jersey.

He early developed a business talent that was recognized by a prominent American importing house dealing in wool and hides, and was sent to the Far East as their special representative and buyer.

At the outbreak of the war he returned to his home in America, and after a short visit, sailed April, 1915, for England, where he was gazetted to the 3d Battalion, Black Watch. Later, he was transferred to the 8th Battalion, which he joined in France December, 1915, and was killed March 30, while on patrol duty.

The deceased, while not directly connected with the rubber business, was well known in the Far East, where his many friends will be greatly saddened by the news of his death.

WIFE OF A PROMINENT RUBBER MAN.

The many friends of William W. Weitting, vice-president and treasurer of the American Hard Rubber Co., New York City, will sympathize with him in the loss of his wife, who died at their home in College Point, Long Island, New York, last week.

J. C. Rockwell, for many years in charge of the New York warehouse of the United States Rubber Co., died at his home in Brooklyn, New York, on March 4. Mr. Rockwell had many friends in the rubber business and will be greatly missed.

The estate of the late United States Senator Nelson W. Aldrich is estimated to be worth approximately \$5,685,000. His son, Edward B. Aldrich, ex-president of the Continental Rubber Co., New York City, is executor of the estate, which he estimates as follows: Real estate in Rhode Island and Connecticut, \$488,150; bonds in corporations, \$600,214; personal property, \$63,564; cash on hand or in bank, \$100,154; accounts receivable, \$500,154; and stocks in corporations, \$3,932,870.



WILLIAM JOHNSTONE.

News of the American Rubber Trade.

SPECIALIZES IN RUBBER CUTTING KNIVES.

In every rubber factory are likely to be found a variety of knives bearing a diamond-shaped trade-mark enclosing the name, I. P. Hyde. Mr. Hyde started the business of manufacturing shoe knives and shoe tools in Southbridge, Massachusetts, nearly 40 years ago, and that little business has grown until the plant of the Hyde Manufacturing Co., a picture of which is shown here, employs 75 experts in this special branch of manufacture. While this company's product includes many varieties of cutting tools for different trades, a very large proportion of its business is devoted to knives for rubber cutting. Probably this is the only concern in the country which issues a special catalog of such tools for use in rubber factories. The large business which is conducted by this company is the result of the



FACTORY OF THE HYDE MANUFACTURING COMPANY, SOUTHBRIDGE, MASSACHUSETTS.

great care used in the hardening and tempering of each article to specially adapt it to the exacting requirements of the use for which it is intended.

CHANGES IN FISK ORGANIZATION.

E. H. Brodwell, vice-president of the Fisk Rubber Co., Chicopee Falls, Massachusetts, announces the following important changes among the officials:

J. A. Anderson has been appointed factory manager and will supervise the manufacturing departments. Mr. Anderson was connected with the United States Rubber Co. for many years in an executive position, joining the Fisk organization a year ago to do special work.

W. H. Whitlock continues as superintendent in charge of production and George A. Ludington, who was elected vice-president last fall, will devote his entire time to the buying of crude materials. Mr. Ludington's life-long experience in the rubber industry well qualifies him for this important service.

John Kearns, also a vice-president, will take charge of a newly created research department. Mr. Kearns is well known as a rubber and compound expert, having had a comprehensive experience both in this country and abroad.

MANTAU CHEMICAL CO. SUCCEEDS CAMDEN WHITE LEAD WORKS.

Harrison Bros. & Co., Inc., the old-established and well-known paint, chemical and white lead manufacturers, of Philadelphia, have purchased from the N. Z. Graves Corporation the plant formerly known as the Camden White Lead Works, Camden, New Jersey, where they manufactured lithopone and lead products, and will continue the business, with offices at 3500 Gray's Ferry Road, Philadelphia, Pennsylvania, which will be known as the Mantau Chemical Co., although it is owned outright and entirely controlled by Harrison Bros. & Co., Inc.

UNITED STATES RUBBER CO.'S NEW TRADE-MARK.

The United States Rubber Co. has decided to use a "super trade-mark" on all its goods, and to make it a point of honor to market under this mark only the best product—one which, in the words of the company, would mean as much in connection with rubber as the mark "sterling" means in connection with silver.



It consists of a ribbon appearing either on the article itself or in the advertising about any given article of rubber for which the company assumes responsibility. The ribbon is made up of three equal stripes; the centre stripe is white and the other two are blue. Upon the ribbon is placed the United States Rubber Co. seal or the trade-mark of one of the various subsidiary companies of the United States Rubber System. This ribbon carrying the seal or a merchandise trade-mark will be used to distinguish cartons, tire wrappings, boxes, etc., in which rubber products of known quality are packed.

RUBBER COMPANY DIVIDENDS.

A quarterly dividend of 2 per cent on the first preferred stock and a quarterly dividend of 1½ per cent on the second preferred stock of the United States Rubber Co., was paid April 29 to stockholders of record April 15.

The directors of the Kelly-Springfield Tire Co. have declared a quarterly dividend of 4 per cent on the common stock, payable May 1 to stockholders of record April 15. This is an increase of 1 per cent, the previous dividend having been 3 per cent.

The B. F. Goodrich Co. has declared a regular quarterly dividend of 1 per cent, payable May 15 to stockholders of record May 4. On April 26 another quarterly dividend of 1 per cent on the common stock was declared, payable August 15 to stockholders of record August 4.

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of shares of rubber manufacturing companies on April 25 are furnished by John Burnham & Co., 115 Broadway, New York City, and 40 South La Salle street, Chicago, Illinois:

	Bid.	Asked.
Apax Rubber Co. (new).....	66 1/2	67 1/2
Firestone Tire & Rubber Co., common.....	80 1/2	81 1/2
Firestone Tire & Rubber Co., preferred.....	114	76
The B. F. Goodrich Co., common.....	73 1/2	76
The B. F. Goodrich Co., preferred.....	114	115
Goodyear Tire & Rubber Co., common.....	392	400
Goodyear Tire & Rubber Co., preferred.....	118	120
Kelly-Springfield Tire Co., common.....	71 1/2	72 1/2
Kelly-Springfield Tire Co., first preferred.....	97	98
Kelly-Springfield Tire Co., second preferred.....	97	98
Miller Rubber Co., common.....	285	300
Miller Rubber Co., preferred.....	113	115
Portage Rubber Co., common.....	84	86
Portage Rubber Co., preferred.....	108	110
Rubber Goods Manufacturing Co., preferred.....	54	56
Sawwhart Tire & Rubber Co., common.....	52 1/2	53 1/2
United States Rubber Co., common.....	107 1/2	108 1/2
United States Rubber Co., preferred.....	107 1/2	108 1/2

SILVER KING GOLF BALL TRADE-MARK CHANGED.

John Wanamaker, exclusive distributor of the Silver King golf ball, found that the colored dot used to designate the different Silver King qualities, was trade-marked by A. G. Spalding & Bros. This difficulty, however, was overcome by the latter firm allowing this first shipment of infringing balls to be sold without interference. In the future the Silver King will be marked with a colored dash, red, green, etc., to denote the several grades.

REPORT OF RUBBER GOODS MANUFACTURING COMPANY.

THE Seventeenth Annual Report of the Rubber Goods Manufacturing Co., New York City, has been sent to the stockholders. The president's report describes the special conditions, adverse the first part of the year, with a marked improvement during the last four months of the year, and continuing up to the present time. It also tells of the enlargement of the principal tire plant.

The treasurer's report gives briefly the assets and liabilities, the net profits and dividends and the surplus at the close of the year 1915.

Both reports are given in full below:

THE PRESIDENT'S REPORT.

TO THE STOCKHOLDERS OF THE RUBBER GOODS MANUFACTURING CO.:

While the sales of the company, both in quantity and value, were larger in 1915 than in 1914, the net earnings were less on account of special conditions in the tire department. These adverse conditions made themselves felt throughout the entire heavy buying season, but from September on and continuing from January 1 of this year up to date a marked improvement has occurred in the tire department.

Still further expansion of our tire facilities has become necessary owing to the rapid increase in this business recently, and on account of these changes, necessitating the enlargement of the Morgan & Wright plant and the providing of additional working capital needed for the larger business transacted, we issued during the year and sold to the United States Rubber Co. \$5,000,000 of 5 per cent debenture bonds of Morgan & Wright, maturing December 1, 1918.

The report of the treasurer appended hereto gives the consolidated general balance sheet and consolidated statement of the Rubber Goods Manufacturing Co. and its subsidiary companies for the fiscal year ended December 31, 1915.

Respectfully submitted,

ELISHA S. WILLIAMS, PRESIDENT.

THE TREASURER'S REPORT.

RUBBER GOODS MANUFACTURING CO. AND SUBSIDIARY COMPANIES.

CONSOLIDATED GENERAL BALANCE SHEET, DECEMBER 31, 1915.

ASSETS.	
Property, plants and investments.....	\$33,656,910.00
Inventories, manufactured goods and materials.....	\$11,967,386.44
Cash.....	3,556,440.96
Bills and accounts receivable.....	7,829,575.81
Stock owned in General Rubber Co.....	\$1,666,700.00
Securities owned.....	390,822.55
Sinking fund cash in hands of trustee.....	476,251.32
Miscellaneous assets.....	521,131.06
Total Assets.....	\$60,065,221.14

LIABILITIES.	
Capital stock, preferred.....	\$10,351,400.00
Capital stock, common.....	16,941,700.00
Capital stock, subsidiary companies.....	3,500,000.00
Bonds of Mechanical Rubber Co. and New York Belting and Packing Co.....	\$791,000.00
Debentures of Morgan & Wright.....	5,000,000.00
Bills and accounts payable.....	10,667,700.24
Accounts payable to General Rubber Co.....	1,106,331.17
Reserve for Federal income tax.....	31,005.65
Reserve for accidents to employees.....	111,489.14
Fixed surplus (subsidiary companies).....	4,490,318.65
Surplus.....	9,064,776.29
Total Liabilities.....	\$60,065,221.14

Contingent liabilities for certain guarantees, which are offset by corresponding contingent assets, are not included.

CONSOLIDATED SUMMARY OF INCOME AND PROFIT AND LOSS FOR THE YEAR ENDED DECEMBER 31, 1915.

Earnings.....	\$2,037,744.68
Income from investments.....	133,336.00
Total.....	\$2,171,080.68

LESS:	
Expenses of home office.....	\$108,664.50
Interest on bonded and floating debt.....	700,644.18
Federal income tax, 1915.....	31,605.65
Total.....	\$840,914.42
Net Profit.....	\$1,330,166.26
Dividends.....	1,268,432.00
Surplus for the period.....	\$61,734.26
Surplus, January 1, 1915.....	9,003,042.03
Surplus, December 31, 1915.....	\$9,064,776.29

Respectfully submitted,

E. J. HAYHORN, Treasurer.

*Includes \$205,000.00 paid minority interests in subsidiary companies.

The officers remain the same as last year; also the directors, with the exception of Charles A. Hunter, resigned.

PORTRAIT AND BUST OF GOODYEAR.

A window display of interest to everyone connected with the rubber business was arranged in the building of the United States Rubber Co. at 1790 Broadway, New York City. The central attraction was an oil painting of Charles Goodyear, which was painted on a sheet of hard rubber, about 1850, by the celebrated artist, G. P. A. Healy. This picture is considered the finest portrait of Mr. Goodyear extant. At the left was the bronze bust of Charles Goodyear, made by Tiffany & Co., which usually stands in the directors' room of the United States Rubber



WINDOW DISPLAY OF GOODYEAR RELICS.

Co., a replica of which adorns the railway station at Naugatuck, Connecticut. Below was a very ornate piece of furniture, a desk or table made entirely of hard rubber. This piece of furniture was exhibited at the first World's Fair at the Crystal Palace in London in 1851, and was afterward used as a desk by Charles Goodyear. Besides this there were two canes, also made of hard rubber, one of which was carried by Mr. Goodyear in 1855 and the other was presented by him to Samuel Colt, grandfather of Samuel P. Colt, president of the United States Rubber Co. Below these, but not shown in our picture, were framed documents proving the authenticity of the articles.

REPORT OF THE CANADIAN CONSOLIDATED RUBBER COMPANY, LIMITED.

VICE-PRESIDENT and General Manager T. H. Rieder, of the Canadian Consolidated Rubber Co., Limited, under date of April 4 submitted his annual report covering the year ending December 31, 1915. He states that the volume of business done in 1915 was 20.43 per cent greater than in 1914. While the selling values of some classes of manufacture were advanced, others were reduced, so that the whole difference is very small. This increased volume was attained by the sale of automobile tires throughout the year, and by other lines especially during the last four months of the year.

Continuing, Mr. Rieder reports:

The stocks of raw materials show quite an increase, due to increased cost and somewhat larger supplies kept on hand. Manufactured goods show practically no change as a whole, although we were better prepared with tire stocks than the year before.

We have now completed a five-year period of our present sales plan and the position of your company in the rubber trade of Canada, as well as the profits, have progressively demonstrated the stability of this policy. Losses by bad debts spread over 15,000 active retail accounts have not been abnormal at any time during this period, and due to the policy pursued of making provision for possible bad debts, in proportion to sales, the unused reserve for bad debts is always ample.

Your directors sold November 1, 1915, 5 per cent short date debentures to the amount of \$2,500,000. The proceeds were used to reduce existing bank loans, and resulted in a slight saving of interest.

The continuity of staff and management of your company has progressively manifested itself in efficiency and loyalty to your company and in its desire and ability to serve the retail trade in Canada.

All your properties have been maintained in first class operating condition. Any expenditures for repairs and replacements have been charged to cost of operating.

For 1916 your directors anticipate a continuance of the confidence which the retail trade has in the past given to your company. The year has started with good prospects and your directors have found it necessary to reopen the Granby footwear factory, which had been non-operative for two years, as the requirements of our new export department promise to overtax our mills now operating.

Mr. Rieder closed his report with a brief reference to the death of President McKechnie, on February 8, and an expression of appreciation of his many years of valuable service.

The financial statement of the company is given in full below:

COMBINED STATEMENT CONSOLIDATED AND CONSTITUENT COMPANIES, DECEMBER 31, 1915.

ASSETS.	
Property and plants.....	\$5,607,142.2
Inventories, manufactured goods and materials.....	\$3,432,745.62
Cash.....	21,180.65
Accounts and bills receivable.....	1,490,492.65
Investments, including good will.....	4,218,056.00
Miscellaneous.....	276,675.50
	<u>\$15,096,066.68</u>
LIABILITIES.	
Preferred capital stock.....	\$3,000,000.00
Common capital stock.....	2,805,500.00
	<u>\$5,805,500.00</u>
Six per cent bonds due October 1, 1946.....	2,597,000.00
Five per cent debentures due December 1, 1918.....	2,500,000.00
Bills payable.....	271,967.04
Accounts payable and sundry accruals.....	460,487.82
Reserve for bad debts, depreciation, etc.....	17,081.96
Surplus.....	2,690,298.76
	<u>\$15,096,668.68</u>
INCOME.	
Net sales, footwear, tires, mechanical and miscellaneous.....	\$7,522,147.40
Cost of goods sold, selling and general expenses, taxes, interest on borrowed money, repairs, depreciations, provisions for bad debts and tire replacements, net.....	6,987,168.87
	<u>\$534,978.53</u>
Dividends paid on preferred stock.....	192,123.75
	<u>\$342,854.78</u>
Net addition to surplus.....	2,347,263.99
Surplus January 1.....	\$2,690,118.77
	<u>\$2,690,298.76</u>
Add adjustment ledger value to par on bonds of this company purchased under par.....	179.99
	<u>\$2,690,298.76</u>

OFFICERS AND DIRECTORS OF THE CANADIAN CONSOLIDATED RUBBER CO., LIMITED.

At the annual meeting of the shareholders 11 directors were re-elected. The vacancies caused by the death of President McKechnie and the retirement of A. J. Kimmel were filled by the addition of R. C. Colt and W. A. Eden, both of Montreal, the full list being as follows:

Walter Binmore, Montreal, Quebec.
R. E. Jamieson, Montreal, Quebec.
E. W. Nesbitt, M.P., Woodstock, Ontario.
R. B. Price, New York City.
W. G. Parsons, New York City.
Homer E. Sawyer, New York City.
Elisha S. Williams, New York City.
Colonel S. P. Colt, New York City.
T. H. Rieder, Berlin, Ontario.
V. E. Mitchell, K.C., Montreal, Quebec.
R. C. Colt, Montreal, Quebec.
W. H. Robinson, Granby, Quebec.
W. A. Eden, Montreal, Quebec.

At a meeting of the directors following the shareholders' meeting the following officers were appointed: W. H. Robinson, president; T. H. Rieder, vice-president and general manager; W. A. Eden, secretary; Walter Binmore, treasurer; R. C. Colt, assistant secretary; A. Dwyer, assistant treasurer; J. P. B. Daigneau, assistant treasurer.

THE NEW YORK UNDERWRITERS' LABORATORIES.

The work of the electrical department of the Underwriters' Laboratories is conducted partly at the principal office and testing station in Chicago, and partly at the electrical testing station maintained in connection with the New York office. This arrangement, in effect since May, 1912, has been found to be very convenient and economical, inasmuch as a large proportion of the manufacturers of electrical wares are located in the east.

The electrical testing station in New York is located at 92 Vandam street, in a building adjoining a sub-station of the New York Edison Co. This location makes available for test purposes supply circuits of a range of voltage and current capacities that would be difficult to obtain elsewhere. When special apparatus requires facilities not furnished by the testing station equipment, arrangements are made for doing the work at the factories where the devices are made, or by means of special equipment arranged for the purpose. The station is provided with equipment for insulation resistance tests for rubber-covered wires, although most of this work is conducted at the Chicago office.

The New York office and electrical laboratory are in charge of Dana Pierce, vice-president; E. P. Slack and William Small, associate electrical engineers, and C. H. Holway, laboratory assistant.

UNITED STATES CUSTOMS RULING ON TOY BALLOONS.

A rubber balloon is a toy, even though it has an advertisement painted upon it. Such is the decision of Judge Sullivan in the case of Q. Nervione, Chicago, Illinois. This merchant imported small rubber balloons, some with and others without advertising matter printed on the sides. The collector levied 35 per cent duty on the articles on the ground they were "parts of toys." Entry at 10 per cent was asked under the provision for "manufactures wholly or in chief value of india rubber or gutta percha, not specially provided for." One of the protestant's witnesses testified that most of the balloons were sold for advertising purposes. The general appraiser claimed that nowhere in the record was there proof that the balloons were not used by children as playthings, or that they were reasonably fitted for other purposes. Affirming the collector, the decision held that advertising matter on balloons did not prevent a child from using them as playthings.

W. O. RUTHERFORD.

W. O. RUTHERFORD, the recently appointed general sales manager of The B. F. Goodrich Co., started with that company back in the nineties in a clerical position at the Akron office. From this position he advanced to a position in the sales organization at the Detroit branch. Early in 1910 he was made manager of the Denver branch. A year and a half later he was promoted to the position of branch manager in Buffalo, where his services during the eight years that followed were largely responsible for the popularity of Goodrich products in that district. In July, 1910, he was brought back to Akron as assistant to H. E. Raymond, who has relinquished the office of general sales manager, but will continue actively as vice-president, exercising general supervision over sales and advertising policies.



W. O. RUTHERFORD.

The title of assistant general manager of sales was formally conferred upon Mr. Rutherford in March, 1914, and his election as head of the Goodrich sales organization is the latest step in a career that has been an unbroken record of real achievement.

Unlike the duties of a sales manager who has one of a few products on which to concentrate his efforts, Mr. Rutherford directs nearly 500 salesmen of the most extensive lines manufactured in America, and there are seventy odd branches and depots scattered throughout the country.

Mr. Rutherford brings to his new position the ripe experience of a successful field salesman, together with a rare knowledge of men and how best to inspire them with his own enthusiasm and aggressiveness.

THE NEW YORK PREPAREDNESS PARADE.

A meeting of New York's representative rubber men was held at the Waldorf-Astoria on April 11 to organize the Rubber Division of the Preparedness Parade that takes place in New York City Saturday, May 13.

George B. Hodgman, Hodgman Rubber Co., presided, and introduced the several speakers. A committee was appointed, consisting of H. G. Cleveland, chairman, Harry S. Vorhis and W. G. Ryckman.

Through the exertions of this committee, a widespread interest and enthusiasm has been generated and the rubber trade will undoubtedly form an important part of the procession, and be most creditable to this industry.

Amadee Spadone, of the Gutta Percha Rubber Manufacturing Co., has been appointed marshal of the rubber division. He will appoint his own staff.

Two bands have been engaged for this division, which is expected to be assigned a position immediately after Mayor Mitchel and his escort, thus heading the parade. The Rubber Division will assemble at 8:30 A. M. on Duane street, with head

of column resting on Broadway, and will move at 9:30 sharp, which will enable this division to dismiss at noon.

Trade banners will lead the various divisions of representative rubber concerns, each man carrying an American flag, and wearing an arm band bearing the legend "The Rubber Club of America, Inc."

Many rubber concerns report their intention of being represented, and from present indications, there are likely to be between 2,000 and 3,000 men in this division.

RUBBER CLUB EXECUTIVE COMMITTEE MEETING.

The Executive Committee met on April 14 with the following members in attendance:

President Harvey S. Firestone, chairman; George B. Hodgman, William E. Bruyn, Van H. Cartmell and Henry C. Pearson.

The business relating to the election of standing committees resulted as follows:

NOMINATING COMMITTEE.

Homer E. Sawyer, chairman, United States Rubber Co., New York City.

Bertram G. Work, The B. F. Goodrich Co., Akron, Ohio.

Charles T. Wilson, Charles T. Wilson Co., Inc., New York City.

Henry C. Pearson, India Rubber Publishing Co., New York City.

Russell Parker, Parker, Stearns & Co., Brooklyn, New York.

BANQUET COMMITTEE.

George B. Hodgman, chairman, Hodgman Rubber Co., Tuckahoe, New York.

Henry C. Pearson, India Rubber Publishing Co., New York City.

William T. Cole, Fabric Fire Hose Co., New York City.

OUTING COMMITTEE.

Philip E. Young, chairman, Acushnet Process Co., New Bedford, Massachusetts.

Robert L. Rice, Hood Rubber Co., Watertown, Massachusetts.

Francis H. Appleton, Jr., F. H. Appleton & Son, Inc., Boston, Massachusetts.

The following were nominated as chairmen of district committees, with power to appoint the local members:

For Akron, Ohio, W. O. Rutherford, The B. F. Goodrich Co.

For Trenton, New Jersey, J. S. Broughton, United & Globe Rubber Manufacturing Cos.

For New York City, Clarence H. Low, United States Rubber Reclaiming Co.

The following were admitted to membership:

FIRM MEMBERS.

Goodyear Tire & Rubber Co., Newell C. Shepard, New York City.

Quality Tire & Rubber Co., Charles A. Besaw, Hartville, Ohio.

ASSOCIATE MEMBERS.

Samuel Rosenblatt, Boston, Massachusetts; Plymouth Rubber Co., Canton, Massachusetts.

William E. Green, Boston Belting Co., 100 Reade street, New York City.

CHANGES AND APPOINTMENTS, GOODYEAR TIRE & RUBBER CO.

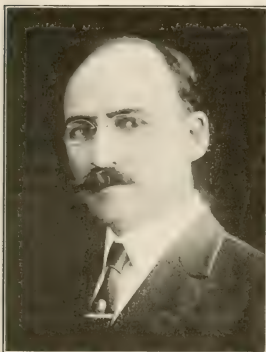
R. W. Rost, Newark, New Jersey, salesman, has been promoted to managership of the Goodyear branch at Albany, New York, succeeding E. B. Sigerson, recently appointed manager of the Buffalo branch.

J. A. Leatherman, Portland, Oregon, salesman, has been made manager of the branch in that city.

L. H. Vaughan, former manager at Utica, New York, has been appointed manager of Goodyear's branch at Newark, New Jersey. He is succeeded at Utica by F. G. Richards, who has been connected with the Newark branch as salesman.

THE DEAN OF RUBBER ADVERTISING.

THE press of the country is taking note of the fact that E. C. Tibbitts has been advertising manager of The B. F. Goodrich Co. for twenty years. Incidentally the newspapers are saying some very nice things about the gentleman anent his twentieth commercial birthday. As a matter of record, Mr. Tibbitts has undoubtedly held down his special job longer than any



E. C. TIBBITTS.

man in the trade. He came at a time when the company was just entering upon its wonderful and symmetrical expansion. When the young giant among rubber companies struck its gait it took a keen intellect in the publicity field to keep ahead of it. Those familiar with Goodrich advertising will agree that Mr. Tibbitts showed both the necessary speed and endurance.

A mental review of the publicity efforts that have come from under the deft hand of this advertising manager tells the story. They are all individual, are free from bombast, and are singularly sincere. They embrace all lines of publicity, replicas of notable portraits, beautifully illustrated booklets, libraries of route books, sign posts at every country cross roads, lectures, "movies," window displays, newspaper specials, a bright "house-organ" and so on, ad infinitum.

In all this Tibbitts is the suggester, writer, critic and editor.

A huge task—it is well done—and we tender our congratulations and felicitations to that unassuming gentleman who signs himself "E. C. T."

TRADE NOTES.

The Birmingham Iron Foundry, Derby, Connecticut, is remodeling its plant and adding a wing 62 x 208 feet, with bay 40 x 140 feet, the new part to be all steel construction, with Fenestra steel sash and mostly glass. There will also be a flask storage runway, 35 x 140 feet, with traveling crane. Contracts for these additions have been placed, including four traveling cranes, and it is expected that the work will be completed by August 1.

A permanent injunction has been issued in the suit of the Royal Equipment Co., Bridgeport, Connecticut, against Max Rich and the Rich Auto Supply Co., New York City, restraining Rich from infringing the Royal company's rights by using the Raybestos trade-mark and silver edging on brake lining, and calling for the destruction of all offending lining and literature.

J. P. Devine Co., New York City, manufacturer of vacuum dryers, vulcanizers and other specialties, will remove the first of this month to the 20th floor of the Forty-second street building, gaining thereby nearly three times as much floor space as in the old quarters on the third floor of the same building as well as the greater light and quiet obtainable higher up. The offices will be newly furnished, with special reference to a more convenient conduction of the company's New York business. L. W. Treichler will continue in charge, and Mr. Devine

will probably spend more time in the New York office than he has hitherto.

The Picher Lead Co., Joplin, Missouri, which has plans for a smelter at Henryetta, Oklahoma, will install equipment for a 4000-retort plant. M. R. Bump, Henryetta, is construction engineer in charge.

A serious strike situation is noted at the plant of the National Cable & Conduit Co., Hastings-on-the-Hudson, New York. This company has been manufacturing war munitions and employing about 3,500 hands. About one-third of the number walked out on the 13th and 14th, and on the 17th the strikers attacked the deputy sheriffs, stoned those who remained at work, broke every window on the front of the long factory, and threw stones through the windows of passing railroad trains. The militia was called out to preserve order and to protect the factory, which closed down, pending a settlement, which was reached on the 26th, by the workmen accepting the company's offer of an increase of 2 cents an hour. The plant resumed operations on the 27th ultimo.

The Durst Manufacturing Co., Inc., manufacturer of mechanical rubber goods and plumbers' specialties, has moved to 105-107 Chambers street, New York City.

Additions and improvements are being made in the Revere Rubber Co.'s New York offices at 59 Reade street, of which H. L. Williams is general sales manager.

Gustave Kush, manufacturer of mechanical rubber goods, has removed from 60 Beekman street, New York City, to 3 Park Row, where he now has his office at room 41.

The I. J. Cooper Rubber Co., Cincinnati, Ohio, has increased its capital stock from \$100,000 to \$225,000.

The Textile Machine Works, Reading, Pennsylvania, has been authorized to increase its capital stock from \$60,000 to \$150,000.

Adolph Hirsch & Co., importers and dealers in crude rubber, have removed to new offices in the World Building. Their address is now Suite 717 to 722, 56 Park Row, New York City.

George E. Austin Co., mechanical and electrical goods, and the Imperial Rubber Co., George E. Austin, general manager, New York City, have removed their offices to the Equitable building, 120 Broadway.

On April 19 meetings were held simultaneously in New York City, Chicago, Illinois, and Los Angeles, California, by members of the Transcontinental Purchasing Agents' Association. The three cities were connected by telephone, and receiving instruments distributed to all who attended enabled them to listen to remarks made in each of these cities, also vocal selections, while the eastern members were enabled to hear the roar of the surf of the Pacific Ocean, thousands of miles away. The Chicago meeting was presided over by F. A. Marsh, purchasing agent for the Link Belt Co., Chicago. In the list of directors may be noted E. L. McGrew, of the Standard Underground Cable Co., and F. W. Lingley, of the American Hard Rubber Co.

At a meeting of creditors of the American Rubber Reclaiming Co. and the Germantown Almegum Manufacturing Co., both of Germantown, Philadelphia, Pennsylvania, a committee was appointed to investigate and recommend upon the prospect of reorganizing the first named company, whose assets were appraised at \$85,437.62. The liabilities amount to \$143,281.18, of which \$37,000 is doubtful. The assets of the Germantown Almegum Manufacturing Co. were appraised at \$33,586.50 and liabilities at \$234,455.42.

Commodore E. C. Benedict, formerly director of the United States Rubber Co., New York City, who has an extensive and beautiful estate at Greenwich, Connecticut, proposes at his own expense to convert it into a model bird sanctuary on plans laid down by the Greenwich Bird Protective Association, an organization of prominent and wealthy residents of that town.

NEW INCORPORATIONS, WITH AUTHORIZED CAPITAL. ETC., 1916.

Allen Tire & Rubber Co., The, March 21 (Ohio), \$10,000. Frank J. Allen, W. H. McMorris, Joseph N. Ackerman, David L. Shaw and S. Milder. Principal address, Cleveland, Ohio. To deal in rubber tires.

Allen & Reeves Shoe Co., Inc., March 6 (New York), \$25,000. William J. Allen, James E. Reeves and Harry E. Reeves—all of Watertown, New York. Shoes, rubbers, etc.

Buffalo Tire Service Co., Inc., April 7 (New York), \$1,000. A. Foshy, 120 Broadway, Russell Goldman, 1190 Madison avenue—both in New York City, and J. Oliver Murphy, Mount Vernon, New York.

Central Auto & Tire Co., Inc., February 11 (Iowa), \$10,000. T. L. Kennedy and O. R. Arnold. Office, Davenport, Iowa. To deal in second-hand automobiles, accessories, etc.

Dunlop Tire Sales Co., Inc., April 13 (New York), \$1,000. Otto and L. A. Braunwarth and Albert Bracht—all of 1808 Broadway, New York City.

Effpee Manufacturing Co., Inc., March 6 (New York), \$10,000. Max S. Levine, 321 Stone avenue and Beatrice Markowitz, 1272 41st street—both in Brooklyn, New York, and Harry Dobel, 483 East 170th street, New York City. To manufacture gaiters, rubberized materials, etc.

E-Z On Fastener Co., Inc., April 3 (New York), \$50,000. Seymour Bookman, 144 West 77th street, and Ethel Beneau, 17 East 105th street—both in New York City, and Samuel H. Harris, 449 Greene avenue, Brooklyn, New York. To manufacture devices for automobiles of rubber and other materials.

Fellsway Rubber Co., April 5 (Massachusetts), \$95,000. Louis H. Williams, Framingham; Franklin P. Gowing and Joseph E. Eaton—both of 230 Purchase street, Boston—both in Massachusetts. Factory and principal office, 30 Locust street, Medford, Massachusetts. Louis H. Williams, president. To manufacture mechanical molded goods, especially rubber soles and heels.

Giant Rubber Co., Inc., April 25 (New York), \$50,000. Abraham Feldman, 519 Willoughby avenue, Brooklyn, New York; Alexander Weiss, 711 East Twelfth street, and Norman N. Nacman, 233 Broadway—both in New York City. To manufacture rubber goods, tires, etc.

J. & D. Tire & Rubber Co., April 8, 1916 (North Carolina), \$500,000. Par value of shares \$100. C. C. Coddington and T. C. Guthrie—both of Charlotte, North Carolina, and H. O. Smith, Indianapolis, Indiana. Office, Charlotte, North Carolina. To manufacture pneumatic tires.

King Tire & Rubber Co., Inc., April 13 (New York), \$1,000. C. O. Henderson, 103 Kensington avenue, Herbert T. Auerbach, Statler Hotel, and John H. Trauter, 101 Crescent avenue—all in Buffalo, New York.

King Tubeless Rubber Co., March 15 (Delaware), \$300,000. E. D. Buck, George W. Dillman and M. L. Horthy—all of Wilmington, Delaware. Office, 328 du Pont building, Wilmington, Delaware. To sell and manufacture all forms of King tubeless patent tires for automobiles, auto trucks, etc.

Marathon Tire Co. of New England, April 12 (Maine), \$100,000. George F. Gould, president and treasurer; N. M. Kent, director, both of Portland, Maine. Office, Portland, Maine. To manufacture and deal in rubber goods, rubber tires, etc.

National Adhesive Co., Inc., The, March 17 (Massachusetts) \$15,000. Earl F. Olson, 86 Norfolk avenue, Swampscott, Massachusetts; Ethel J. Looke, 76 Michigan avenue, and Joseph F. McGrath, 28 High Rock street—both in Lynn, Massachusetts. Office, Lynn, Massachusetts. To deal in rubber cements of all kinds, rubber heels, etc.

New York Rubber Disc Co., Inc., April 21 (New York), \$2,000. Harry Kovinow and Morris Manofsky—both of 1713 Third ave-

nue, and Morris Kavenoff, 152 East 103d street—both in New York City. Rubber supplies and discs.

Peters-Tucker-Hay Rubber Co., March 18 (Colorado), \$5,000. H. G. Peters, E. M. Tucker and R. E. Hay—all of Denver, Colorado. General auto accessories and filling station company.

Portland Vulcanizing Co., March 22 (Maine), \$10,000. Philip J. Lanicault, president; Conrad T. Beardsley, treasurer, and Harold H. Wish, director—all of Portland, Maine. Office, Portland, Maine. To manufacture and deal in rubber tires, etc.

Orange Vulcanizing & Supply Co., February 18 (New Jersey), \$50,000. James J. and Annie Davis, Peter T. and Elizabeth D. Loughlin—all of 225 Main street, Orange, New Jersey. To deal in automobile accessories, etc.

Never-Hole Tube Co., March 30 (Delaware), \$300,000. H. H. Waller, G. E. Touloupoulos and M. Friedberg—all of 140 Nassau street, New York City. Office, Capital Trust Co., Dover, Delaware. To manufacture and deal in inner tubes and automobile tires.

Quaker City Rubber Co., March 31 (Pennsylvania), \$50,000. Charles A. Daniel, William F. Metzger and James T. Moore—all of Philadelphia, Pennsylvania. Office, Philadelphia, Pennsylvania. To manufacture and deal in crude rubber, balata and gutta percha, and all and any of the products into which crude rubber, balata or gutta percha, in any form enters as a constituent part.

Rex Scrap Iron & Rubber Co., Inc., The, April 18 (New York), \$1,000. Morris Korn and Morris Jaffee—both of 336 Dumont avenue, and Frank Tindler, 482 Sackman street—both in Brooklyn, New York.

Robert Soltan & Co., Inc., April 24 (New York), \$50,000. George Hammerlund, 866 Forty-ninth street, Brooklyn, New York; Charles Oakes, 45 East Eighty-third street, and E. G. Reardon, 541 East Seventy-eighth street—both in New York City. To manufacture gutta percha tissue, rubber products including "Galalith," etc.

Standard Chicle Refining Co., April 7 (Delaware), \$110,000. Orja G. Corns, Valdamar A. Johnston, Jr., Matthew E. Hosely and Adolph P. Rapp—all of Chicago, Illinois. Office, Capital Trust Co. of Delaware, Dover, Delaware. To refine or manufacture a substitute for chicle, and to manufacture rubber or any article having for its base rubber, chicle or natural gum.

Triple Tread Tire Co., March 20 (Delaware), \$500,000. H. G. and M. Lund and Edward Grunich—all of Chicago, Illinois. Office, Guarantee & Trust Co., Ford building, Wilmington, Delaware. To manufacture and deal in automobile tires, tubes, etc.

Triumph Tire & Rubber Co., April 5 (New York), \$1,000. George L. Campbell, 415 West 141st street; George T. Bernard, 294 Sixth avenue, and Garrett Cooper, 166 West 72d street—all in New York City.

Tropical Shipping & Trading Co., Inc., The, March 17 (New York), \$40,000. Adrian Cairns, 4111 Ferris street, Woodhaven, New York; Oswald Carliss, Sterling, and W. A. Black, Montclair—both in New Jersey. To deal in rubber, precious woods, ivory and other tropical products.

White's Spring Tire Co., March 7 (Oklahoma), \$50,000. Jesse W. White, M. J. O'Connor, John F. Sumner, Elta H. Jane, H. S. Bruner and L. E. Jalbert—all of Edmond, Oklahoma, and F. H. Bean, Los Angeles, California. To manufacture and deal in automobile accessories and to manufacture and deal in White's cushion automobile tire.

Yankee Tire & Rubber Co., Inc., April 3 (New York), \$3,000. Randolph Russell, Livingston, Richmond County, New York; Harry E. Dodge 113 East 80th street, and Charles McAlpin Pyle, 11 East 68th street—both in New York City.

PERSONAL MENTION.

Edward H. Huxley, president of the United States Rubber Export Co., arrived from England on the steamer "St. Paul" on April 14. Mr. Huxley, it will be remembered, was a passenger on the "Sussex" when she was destroyed on March 24. His prompt and thorough report of the affair to the United States Government brought him commendation from newspapers all over the country.

J. P. Krentz, formerly superintendent of the foundry of the Buffalo Foundry & Machine Co., Buffalo, New York, has been appointed works manager of the company.

Eugene Pearl, the many-sided man—artist, attorney and inventor, whose corset shield and syringe nozzle patents have been mentioned in THE INDIA RUBBER WORLD, has just invented an anti-skid shoe support for bootblack stands, the idea being to hold the shoe steady under the manipulations of the polisher.

Victor von Schlegell was recently elected vice-president of the United & Globe Rubber Manufacturing Co., Trenton, New Jersey, with headquarters in the Equitable building, New York City. Franklin Edson has been made assistant to Mr. von Schlegell.

R. L. Chipman, dealer in crude rubber, gutta percha and allied gums, has moved into more commodious quarters at 23-25 Beaver street, New York City.

The Rev. Dr. W. Warren Giles, of Orange, N. J., who has been a speaker at several dinners of The Rubber Club of America, Inc., while running for a train recently, failed to see a train approaching from the opposite direction and was knocked down and severely bruised. His many friends in the rubber trade will be glad to know that he is now as well—and as witty—as ever.

Albert Waterhouse, president, The Waterhouse Co., Limited, Honolulu and Singapore, was in New York last month on business pertaining to the various interests managed by his company. He reports that the Pahang and Jahore plantations, through the agency of the Waterhouse company, are progressing under most favorable circumstances.

W. Stuart Gordon, well known crude rubber man, formerly of Manaus, who recently arrived in New York from the Far East, sailed for Para April 26.

Francisco Conde de Athayde, a well known rubber merchant of Manaus, Brazil, is in New York on a two months' business trip.

Andrew Kangas, formerly with the commission house of Thomsen & Co., New York City, has become assistant export manager for the Fisk Rubber Co., Chicopee Falls, Massachusetts, assisting John B. Maus.

W. K. Frederick has been appointed assistant sales manager of the Batavia Rubber Co., Batavia, New York. Mr. Frederick was formerly special jobbing representative in the middle west for the Pennsylvania Rubber Co., and later with the McGraw Tire & Rubber Co.

The McGraw Tire & Rubber Co. of New York, Inc., with general offices and works at East Palestine, Ohio, announces that C. E. Wertman, formerly assistant branch manager, has been promoted to the position of resident manager of the New York office, succeeding R. F. Hobron, and that E. E. Cowan has been appointed sales manager of the New York territory.

The Associated Garages of America has changed its name, to represent its varied interests more accurately, to the National Retail Automobile Trade Association.

At the twentieth annual meeting of the National Fire Protection Association, to be held at Chicago, Illinois, May 9, 10 and 11, one subject to be considered and discussed will be "Standard Hose Couplings and Hydrant Fittings for Public Fire Service."

TIRE FABRIC TESTS SHOWN BY LANTERN PROJECTION.

THE wide difference of opinion regarding the testing of fabrics is doubtless due in a large measure to the inaccuracy of the apparatus employed. Great variations are obtained from the same fabric tested on the same dynamometer when held by different means. It is, therefore, obvious that the more data submitted under these varying conditions, the wider the difference of opinion may be. Textile fabrics, owing to their nature and lack of sharp outline, are difficult to reproduce by photo-

graphic means. Lantern slides, or motion pictures, when magnified and projected upon a screen are too indefinite to illustrate the actual effect of stress upon the fabric. The value of motion photography for this work is greatly lessened by the fact that a film is usually in con-

stant motion and a more deliberate study of the sample is impossible.

Henry L. Scott & Co., manufacturers of rubber testing machines, conceived the idea of reproducing or projecting upon a screen by means of an opaque projection lantern a highly magnified view of a fabric sample during a test. The apparatus shown in the cut was therefore constructed and exhibited before Committee D-13 of the American Society for Testing Materials in the office of the United States Rubber Co., New York City, on March 17.

Parts of a standard horizontal tire fabric tester were mounted upon an oak base *A* constructed to also support a Balopectin lantern *B*. No recording head was used. The fixed clamp *C* was held rigidly in a horizontal position on a solid iron frame attached to the base. The moving clamp *D* was attached to a draw bar, or stretching screw *E*, operating through a gear box holding the driving mechanism. Hand wheels *F* on either side of the gear box were used to transmit power to the stretching screw and were geared to give any speed desired. The hand wheels *G* at each end of the machine permitted changing clamps quickly. Knurled and adjustment collars, movable upon the thread of the stretching screw, assured the return of the moving clamp to the same position for each sample.

In addition to the flat grip clamps shown in the drawing, other devices were used and by means of interchangeable anvils or gripping surfaces several methods of testing were illustrated. A device was also arranged for working two knives underneath the sample to cut the fabric in such manner as to produce the "gash" test.

The apparatus was installed in a darkened room and the projection made upon a special aluminum screen at a distance of approximately 20 feet. As nearly all tests were made on tire fabric, having 23 ends per inch, each end thus projected was about 1 inch in diameter. Samples were broken in a bone-dry, normal and saturated condition to note the effect of moisture. Tests showing the effect of varying speeds of the moving clamp were also made.

Elongation, number of threads broken, effect of tension, slip in the clamps and comparative values of different methods were readily observed. As innumerable tests could be made and any test repeated, the speed regulated, or the stretching motion stopped for any length of time desired, many interesting points were brought out.

THE GRANT SOLID TIRE PATENT LITIGATION.

THE Circuit Court of Appeals, in New York City, affirmed the decision of the lower court March 17 in the suit between the Diamond Rubber Co., New York City, and the Kelly-Springfield Tire Co., Akron, Ohio. Approximately \$210,000 damages were awarded to the latter company for infringement of the Grant solid tire patent owned by the Kelly-Springfield company. This sum includes five cents per pound on the sales of infringing tires, amounting to over \$130,000, \$27,000 for interest, and an additional \$50,000 "smart money," because of the flagrant character of the infringement.

As this famous patent has been the subject of almost constant litigation since 1896, and suits are still pending, a brief review of the principal facts furnished by a representative of the Kelly-Springfield company is interesting.

The Grant patent No. 554,675 covers the solid rubber tires now commonly used on horse-drawn vehicles throughout the world, and was granted to Arthur W. Grant February 18, 1896. At once, upon its introduction, it drove all other solid rubber tires out of the market, and after becoming established, its sales amounted to around 10,000,000 pounds of tires every year. The patent was infringed almost from the beginning, principally by rubber manufacturers, who endeavored to imitate it and avoid infringement, but their imitations were all short-lived and failures.

Many of the principal rubber companies were prosecuted for infringement, among them The B. F. Goodrich Co., Akron, Ohio; Diamond Rubber Co., Akron, Ohio; Firestone Tire & Rubber Co., Akron, Ohio; Pennsylvania Rubber Co., Jeannette, Pennsylvania; Republic Rubber Co., Youngstown, Ohio; Victor Rubber Co., Springfield, Ohio; Acme Rubber Manufacturing Co., Rutherford Rubber Co. and Thermoid Rubber Co., of Trenton, New Jersey; Hartford Rubber Works Co., Hartford, Connecticut; Morgan & Wright, Detroit, Michigan, and others.

In 1911 the Firestone Tire & Rubber Co. paid damages for infringement. This company also acquired a manufacturing license for the balance of the term of the patent, which expired February 18, 1913. Morgan & Wright acquired a manufacturing license about the same time and paid damages for past infringement.

In the case against the Goodyear Tire & Rubber Co. the defendant won and the patent was declared void in 1902, but subsequently it was adjudged valid by the Federal Courts in Milwaukee, Wisconsin, and New York City, and later on by the Supreme Court at Washington, D. C., after which settlements and adjustments were made.

The decision at Washington, while not directly in the Goodyear case, made the customers of that company liable for infringement and the Goodyear Tire & Rubber Co. made satisfactory settlement. The Thermoid Rubber Co., the Acme Rubber Co. and the Rutherford Rubber Co. also settled, the former paying damages and the other companies making satisfactory arrangements.

Cases are now pending against the Republic Rubber Co., Youngstown, Ohio; the Pennsylvania Rubber Co., Jeannette, Pennsylvania; two cases against The B. F. Goodrich Co., Akron, Ohio, and three cases against the Diamond Rubber Co., Akron, Ohio. Decrees in favor of the plaintiff have been entered in all of these cases and the matter is now before the masters on the accounting, except in the case against one of the Diamond Rubber companies, viz., the Diamond Rubber Co. of New York. In this case the plaintiffs have been awarded by the court five cents a pound on the number of pounds made by the Diamond Rubber Co., amounting to \$130,000, \$50,000 additional damages and \$20,000 interest and costs, a judgment for \$210,000. This is the case that was affirmed in March by the Circuit Court of Appeals in New York.

Besides the above, numerous suits were brought against other

infringers, all of whom acquired licenses and damages against them were not pressed.

The plaintiffs in all these cases have been the Consolidated Rubber Tire Co. and the Rubber Tire Wheel Co. The name of the Consolidated Rubber Tire Co. was changed on January 1, 1914, to Kelly-Springfield Tire Co. It is the same company, its name having merely been changed by amending its charter.

A very large poundage is involved in the suits now pending, that of The B. F. Goodrich Co. approximating five and one-half million pounds.

Suits over this patent have been pending since 1896, the first being against the American Rubber Tire Co. of New York City, wherein the patent was adjudged valid. Then came the decision at Cincinnati adjudging the patent void, which afforded an excuse for infringers. But in 1906-7 the patent was adjudged valid by the Circuit Court of Appeals in Milwaukee, Wisconsin, and New York, and was finally adjudged valid by the Supreme Court of the United States April 10, 1911.

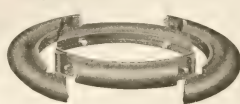
STANDARD PNEUMATIC TUBES AND TIRES.

A tire which is guaranteed for 5,000 miles must have behind it a responsible organization and a corps of experts in every stage of its manufacture. The Standard hand-made tire has such a guarantee molded right on the tire itself. The manufacturers' claims for superiority of these tires are that they are hand-made by experts, are full molded by a process original with them, at a temperature and pressure which produces a perfect cure. Fabrics and materials of superior quality are used in the carcass, and the rubber is carefully selected from uniform grades of the best quality. There is one ply more of fabric used in this tire than in some popular tires. The treads are of a specially tougher rubber, the result of years of study, test and development. They are furnished both smooth and non-skid, the latter bearing a combination of the letter S, the initial of the company. It is the same story regarding inner tubes, pure Para rubber, extra thick, cured by slow vulcanization, extremely tough and heat-resisting. [The Standard Tire & Rubber Co., Hippodrome Building, Cleveland, Ohio.]



MIDGLEY COLLAPSIBLE CORE

The novel method of making this core consists in stamping up a series of thin sheet steel plates that have been prepared so they will adhere to molten iron and casting them in the usual core sand mold. The sections are held in alignment by four plugs that occupy the bolt holes and are cast integral with the core. These are afterward drilled out, forming holes for the retaining bolts of the core, which is then machined in the usual manner.



The interlocking joint is strong and well designed to withstand the severe strain to which cores are subjected. The method of assembling the core by means of the interlocking joints and retaining bolts is very clearly shown in the illustration. [Thomas Midgley, 85 East Gay street, Columbus, Ohio.]

W. A. Kirkpatrick, formerly connected with the Philadelphia branch of the Hardman Tire & Rubber Co., Belleville, New Jersey, has been appointed manager of the branch at Baltimore, Maryland.

DREADNAUGHT TIRE & RUBBER CO. SALE.

The plant of the Dreadnaught Tire & Rubber Co. at Orangeville, Baltimore County, Maryland, was sold on April 12 at public auction to H. James Lepper, a member of the stockholders' reorganization committee who had been designated to make a bid on behalf of the committee. The price paid was \$80,000, being the amount of the upset price fixed by the court. The sale will be ratified, unless cause to the contrary is shown, on May 18.

As indicated by its name, this committee intends to reorganize the business of the old Dreadnaught company and to continue the manufacture of tires at the plant.

THE PERFECTION TIRE ORGANIZATION.

The Perfection Tire & Rubber Co., which has a factory at Fort Madison, Iowa, a fabric plant at Wabash, Indiana, and is also purchasing a plant in California, and the Perfection Tire & Motor Co., of Canada, Limited, are under the same management. The latter company has purchased a plant at Guelph, Ontario. The tire plant of the Champion Auto Equipment Co. at Wabash, Indiana, is also under the supervision of the Perfection Tire & Rubber Co. All three companies have separate offices in the Marquette building, Chicago, Illinois.

LEE TIRE & RUBBER CO. EXPANDS.

Plans and specifications have been completed for a large new mill to replace the present plant of the Lee Tire and Rubber Co. at Conshohocken, Pennsylvania, and it is expected that this addition will be completed in three months' time. The new mill will be located 300 feet in the rear of No. 2 mill and will be two stories in height, 130 feet in length and 80 feet in width. The architecture will conform to the style of the other buildings, which are of the modern type of steel and concrete construction.

The new building will be used for the manufacture of miscellaneous rubber goods and hospital supplies, thus enabling the Lee company to materially increase its tire departments, enough space being available in the present plant to run the total output up to 2,000 tires per day.

TRADE MARK SUIT DISMISSED.

The suit for alleged infringement of trade-mark brought by the Pennsylvania Rubber Co. against the Dreadnaught Tire & Rubber Co. in the United States District Court at Wilmington, Delaware, was closed on March 23, when a decree was entered, dismissing the suit, the Circuit Court of Appeals sustaining the decision of Judge Bradford. The costs of the case were divided between the two parties interested.

VERDICT FAVORABLE TO TIRE COMPANIES.

In the suit of the Automobile Cooperative Association against The B. F. Goodrich Co., the Republic Rubber Co. and the Diamond Rubber Co., all of Akron, Ohio, the jury gave its verdict in favor of the tire manufacturers, and the judge strongly approved the verdict. This practically closes the litigation. Originally five companies were sued, but late in March the suit was dismissed against the United States Tire Co. and the Firestone Tire & Rubber Co. It may be remembered that the Automobile Cooperative Association was formed by automobile owners to buy tires and other supplies at wholesale. The companies refused to sell this association at the prices they sold to dealers. Hence the suit for "restraint of trade." It was proven that there was no combination in restraint of trade, each company acting independently.

COLORED STREAK TIRE TRADE-MARKS.

Among the rulings in regard to trade-marks, it is noted that "a red stripe or tread for rubber automobile tires is not to be rejected because of the prior registration of a blue stripe similarly used and apparently intended to suggest the name 'Blue Streak.' There is enough doubt of the similarity of the marks to pass the application for publication, and register it, if not opposed." We understand this application was by the Fisk Rubber Co.

TRADE NOTES.

The Marion Tire & Rubber Co., Marion, Ohio, has plans under way for a new automobile tire and tube manufacturing plant, to be equipped with the most up-to-date machinery. The building will be constructed of steel and concrete, fireproof throughout, 60x150 feet in dimensions, two stories and basement, with an additional power plant of like construction, 40 x 80 feet in size. The architect is Mr. Dobbins and the contractor, E. Elford, both of Columbus, Ohio.

The Walters Rubber Co. of New York, Inc., recently incorporated, has for its secretary and treasurer Howard S. Walters, for seven years connected with the United States Tire Co. as a salesman and for three years with the Federal Rubber Manufacturing Co., resigning April 1 to organize and manage this new corporation, which will have the exclusive distributing agency for Long Island for Federal tires and tubes, as well as marketing tires and tubes bearing the company's name. The general office of the company is at 54 Main street, Mineola, New York.

The Gordon Tire & Rubber Co., Canton, Ohio, has commenced the manufacture of hard rubber parts for use in the extensive line of druggists' sundries which constitutes an important part of this company's output.

The Victor Rubber Co., Springfield, Ohio, is erecting two new buildings, one 150x40 feet and the other 50x40 feet. These additions are made necessary by the increased pneumatic tire business of the company. The present production of the Victor company is 150 hand-made tires per day, and the entire plant is being worked with a night and day force.

The Perlman Rim Corporation of New York has acquired the automobile rim business of the Jackson Rim Co., Jackson, Michigan. Ground has been broken for an additional building with 40,000 square feet floor-space.

The Western Union Telegraph Co. employs 8,200 messenger boys, it is said, and about 5,000 of this number use their own bicycles in delivering the company's messages. The increased cost of tires has added considerable burden to the upkeep of a wheel. In the future, however, the boys will be able to buy tires at wholesale prices, for it is announced that the company has made arrangements to supply tires at cost.

The Atlas Yarn Co., Globe Village, Massachusetts, recently incorporated with Fred L. Hewitt as president and Frederick J. Quinn as treasurer, has purchased the 16,000 spindle cotton yarn mill of the Hamilton Woolen Co. The mill is in full operation and the new concern intends to increase the output to include the manufacture of tire fabric yarn. Mr. Quinn, who will be the operating head of the new concern, is a practical cotton mill man, having been identified with the textile industry for many years.

Tires may last longer and motorists be less liable to accidents in New York state, now that the Slater bill has become a law. This makes it a misdemeanor to place on any road, highway or public place glass, tacks, nails or other articles which might injure an animal or person, or puncture a tire.

The United States Circuit Court of Appeals has decided that the name "Neverleak" applied to a tire fluid, the composition of which is secret, did not become public property upon the expiration of the patent because the tire fluid itself was never patented, and therefore the original owner of the preparation has the sole right to use this name on his goods.

An interesting computation of the cost of operating an industrial electric truck, as presented by C. E. Ogden, manager of the Walker Vehicle Co., gives as one expense 14 cents per day for tire renewals, or about 9 per cent of the total daily cost. The electric truck referred to is considered the logical successor of the ordinary hand truck used in warehouses, factories and railway terminals.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

A GOODLY percentage of all the automobile tires manufactured in the United States come from Ohio, and this State has come to the front so prominently in the manufacture of rubber goods that the suggestion has been made by an Eastern advertising agency to change its historic appellation, "The Buckeye State" to "The Rubber Plant State."

Men from all parts of the country are coming here, answering the call of the rubber factory boom. Over \$2,000,000 is being spent to solve the housing problem.

The first of last month Akron was host to the Ohio State Automobile Association, and every rubber company in the city united with the Akron Auto Club in entertaining the delegates representing the automobile clubs throughout the State.

An addition to the Ohio Building, now in progress, will be occupied by the Akron City Club, 33 to 50 per cent of the membership of which represent various branches of the rubber industry.

The addition of three great buildings which are nearing completion will make the plant of The B. F. Goodrich Co. much the largest rubber factory in the world. Before these new buildings were erected the Goodrich institution was among the world's largest plants devoted to the manufacture of rubber goods, but with the increased capacity provided by these additions, which are in themselves larger than many widely known rubber factories, the Goodrich plant now ranks far ahead of any others in the rubber trade.

An idea of the size of the Goodrich plant may be gained when it is said that the group of fifty-seven buildings have a floor space of nearly a hundred acres and that one would have to travel 3.8 miles to circle the grounds.

The largest of the new buildings is a finished goods warehouse, 320 feet long and 280 feet wide, with one wing six stories high and another of seven stories. This structure is nearly completed.

The second largest of the three new buildings is six stories high, 300 feet long and 100 feet wide. It will be used for manufacturing and storage purposes. The third is a building that will be utilized as a machine and pattern shop. It is five stories high, 260 feet long and 100 feet wide.

All the new buildings exemplify the latest ideas in factory construction. Lattice steel columns and girders encased in reinforced concrete are used throughout for the frame-work. Each of the buildings has concrete floors, brick walls and steel window-frames and sash. They are equipped with elevators and enclosed fire-escapes, and will have the same adequate sprinkling system that contributes to the safety of all the buildings which constitute the Goodrich plant.

The Akron Rubber Mold & Machine Co. has built a 60 x 115 feet addition to its plant and has also taken over the building

formerly occupied by the Lincoln Rubber Co. and purchased the property used by the Woodruff Novelty Co. New machinery is being installed, and the company expects to more than double its capacity. The Lincoln company building will be used for the vulcanizing tire repair department of the Akron Rubber Mold & Machine Co., this department of its business having more than tripled in the last year.

The Firestone Tire & Rubber Co. is adding a fifth story to its entire plant.

Sherman L. Lewis has been placed in charge of sales promotion by the Firestone company. Mr. Lewis was formerly with the Niagara Lithograph Co. and also in charge of trade aid work for the Remington Arms-Union Metallic Cartridge Co.

The recently reorganized American Tire & Rubber Co., making tires, tubes and accessories, is installing new equipment to meet increased demand. On April 15, a liability contracted by

the old company amounting to \$50,000 in mortgage bonds, matured and was taken care of by the present organization, whose personnel was given in the March issue of THE INDIA RUBBER WORLD. H. L. Houck, previously identified with the Firestone Tire & Rubber Co., and more recently with the Swinehart Tire & Rubber Co., is the general manager

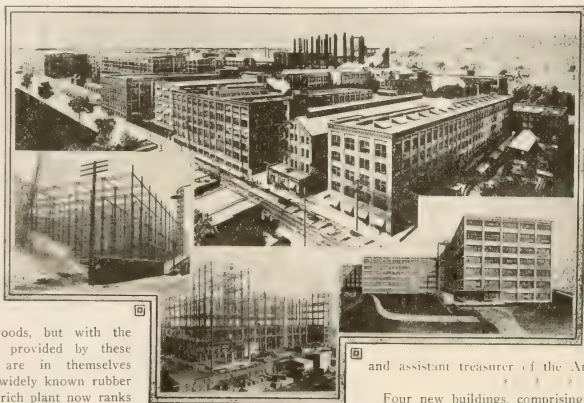
and assistant treasurer of the American company.

Four new buildings, comprising ten acres of floor space, have just been completed at the plant of the Goodyear Tire & Rubber Co. One is a three-story "L" shaped building, 180 x 160 feet, for the solvent department. An eight-story building, 300 x 80 feet, will be used for raw material and manufacturing, and two other buildings, each seven stories high and about 200 x 60 feet in dimensions, are for general manufacturing purposes. In addition, the Goodyear company has under construction, to be completed the first of next year, a crude rubber and manufacturing building comprising 275,000 square feet of floor space; a reclaiming plant, 200,000 square feet; a warehouse, 250,000 square feet; mechanical goods building, 280,000 square feet; a new power house and addition to the main power house of 12,000 horse-power; a garage, 25,000 square feet, and additions to the general office, 40,000 square feet.

The authorized capital of the Goodyear company has been doubled from \$25,000,000 to \$50,000,000, to take care of a 100 per cent dividend on common stock and a new issue of preferred stock to replace the present issue, retired by redemption.

George H. Picklerell, United States consul at Para, Brazil, has been visiting F. A. Seiberling, president of the Goodyear company, having come to Akron for the purpose of interesting the rubber concerns in the development of the Para rubber industry.

The Swinehart Tire & Rubber Co. is turning out a new motorcycle tire with a tread of special non-skid construction.



THE B. F. GOODRICH CO.'S PLANT.

The Briggs Rubber Works is building a brick addition, 100 x 125 feet, to its plant. This will include new offices for the company.

The additions to the plant of the Miller Rubber Co., mentioned in a previous issue, are progressing rapidly.

J. B. Bleier, formerly connected with the Diamond Rubber Co. and more recently vice-president of the Overman Cushion Tire Co., is now in charge of the truck tire department of the Miller company.

Frank Robinson, crude rubber dealer of New York City, has opened an Akron office in the Second National Bank building.

H. H. Henderson, Akron manager for Henderson & Korn, crude rubber dealers, New York City, has recently returned from a sojourn of several weeks in Cuba.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

THE rubber trade continues active in most lines. Clothing people have all the business they want for the present, but are making up new samples to show on the road early in the summer, when it is expected that even the large orders they now have on hand for fall delivery will be increased by further orders and supplementary ones. Boot and shoe manufacturers are fully supplied with orders and their factories will be kept busy until the usual summer shut-downs, and we understand that there is doubt about such shut-downs being any longer than is actually necessary to make repairs and alterations before starting anew on later deliveries. Mechanical goods people have had only moderate demand for hose. Evidently many of their customers are fairly well stocked because of the poor trade in this line last year. In belting, however, there is an added demand, evidently because of the scarcity of leather suitable for belting and its consequent high price. Druggists' sundries and molded goods people have a fair amount of business and are not complaining. The manufacturers have all their factories can attend to. Taken altogether, the trade is in a most satisfactory condition in every branch.

The double fabric which has gone into the first dirigible which has just been completed for the United States Navy was sheeted and cemented at the American Rubber Co. factory at Cambridgeport, and the factory is still manufacturing similar fabric on orders. The demand for carriage cloth is so heavy as to tax the facilities of this Cambridgeport factory and some similar goods are now being manufactured in Naugatuck, and it is hoped soon to add this line to the output of the Stoughton factory of the company.

Judge Morgan, in the United States District Court on April 12, allowed the motion to quash the indictment against Warren B. Wheeler and Stillman Shaw on the ground that the independence of the grand jury which indicted them had been seriously interfered with by the prosecuting officer of the United States Government. Readers of THE INDIA RUBBER WORLD are familiar with the case, whose progress during the last four years has been reported in previous letters. It now seems that the reason for thus finally disposing of the case, was because of the action of the Assistant Attorney General, who directed the grand jurors not to indict another party at the same time Messrs. Wheeler and Shaw were indicted. Judge Morgan holds that the attorney's conduct amounted to improper interference with the rights of the grand jury and that this interference directly affected its decision. He further says:

To uphold what was done by the prosecuting officer in this case is in effect to establish his right to direct the grand jury not to indict a person whom the grand jury had voted to indict. It would make a great inroad on the independence of the grand jury and one of peculiarly dangerous character.

It is hard to conceive of a plainer case of undue interference by the prosecuting attorney than shown by the evidence here. As the indictment returned was directly affected thereby in a substantial particular, it seems to me both upon principle and upon the authorities that it must be quashed.

Lester Leland, vice-president of the United States Rubber Co., and Mrs. Leland, are now on a trip to California.

George Wyman, assistant office manager of the Hood Rubber Co., gave a very instructive lecture on the gathering and shipping of rubber, and manufacture of rubber goods before the Shoe and Leather Class of the Boston Continuation School on the occasion of the graduation of that class on March 24. The lecture was profusely illustrated with lantern slides from negatives taken by Mr. Wyman, who is an expert photographer.

The United States Tire Co., at its New England branch on Commonwealth avenue in this city, celebrated Tire Show Week, the third week in April, the exhibition and management of the



E. H. KIDDER.

entire affair being in charge of E. H. Kidder, the manager of this branch. Fine window displays were shown on the two sides of the wedge-shaped building, which included artistic arrangements of the various tires which are made by this company, together with samples of the crude rubber from which they are made. Facing the front door was a life-sized cut-out of a man rolling a tire toward the visitor. The tire was a real one and the man, although made of cardboard, was so realistic that invariably people dodged out of his way when entering the door. Mr. Kidder and his assistants were present to explain the advantages of their specialties, "Royal Cord," "Nobby," "Chain," "Usco" and plain tread tires. That the affair was a success was proven by a large number of visitors who took advantage of the invitation to attend the exhibition, and I understand the result shows up splendidly on the sales books at Mr. Kidder's office.

A man having the appearance of being an Englishman called upon a rubber man in this city early last month and introduced himself as Mr. Bridge, a brother of two members of the firm of David Bridge & Co., Limited, well-known engineers and millwrights of Manchester, England. He reported that he had just come from Montreal, was in poor health and had been relieved of his money on the way. He needed to go to New York and borrowed a small sum to take him there, promising to return the loan on arrival. His failure to do so induced the lender to write a letter to the Messrs. Bridge, who replied that the man was an imposter and that no member of their family had been in New York since 1912. As the Messrs. Bridge have a large clientele among the rubber trade in this country, your correspondent feels impelled to notify the trade that they may be on the lookout and not be misled by the same story.

Many of the members of the rubber trade are well acquainted with Arthur D. Little, former president of the American Chemical Society. Although Mr. Little's special work has been more in the line of cellulose than rubber he was intimate with Dr. Weber and other rubber chemists and familiar with the trade. Mr. Little has been retained by the Canadian Pacific Railway to establish a central organization for research work in Montreal to carry out Lord Shaughnessy's proposal for a scientific investigation of Canada's mineral, metal, hydro-electric and chemical resources, and to stop waste in forests, mines and mills. This will be known as the Canadian Research Bureau, and its discoveries will be given out in bulletins to merchants and manufacturers.

More than 1,000 persons gathered at the plant of the Monatikot Rubber Works Co. in South Braintree on Patriots' Day, to attend the flag raising in honor of the sixth birthday of this company. Treasurer James H. Stedman was master of ceremonies and addresses were made by Calvin Coolidge, Lieutenant-Governor of Massachusetts; Grafton D. Cushing, former Lieutenant-Governor; Division Superintendent F. S. Hobbs, of the New York, New Haven & Hartford Railroad, and State Senator Langelier, a member of the Massachusetts Prison Commission. The program included a fine luncheon, which was served to the invited guests, among which were many state, town and corporation officials and prominent citizens. Music was rendered during the afternoon by the Stetson Shoe Band. The entire works were then thrown open for inspection. They were in full operation, and the visitors inspected the different processes used in manufacturing "Naturalized" rubber, the product of this mill. Many congratulations were received by President Harlow, Sales Manager Turner and Treasurer Stedman on the progress which has been made by the company in its six years of existence here, and the whole affair was most successful.

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In this connection it may be of interest to note that President Robert C. Harlow, of the Monatikot Rubber Works Co., has been appointed the first Fire Commissioner of the historic old town of Plymouth in this State, the town having voted to change from the old system of a board of fire engineers and give one man, as fire commissioner, full charge of the department. Mr. Harlow had been a member of the water board of that town and was one of the town committee named to report on a more efficient fire department. His extensive business experience should prove valuable in the work which he has undertaken for his home town and Plymouth is to be congratulated upon acquiring his services in this important department.

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In the Boston letter last December mention was made of the purchase of land by parties who proposed building a rubber factory near Maplewood Station. This has materialized in the incorporation of the Fellway Rubber Co. with an authorized capital of \$95,000, of which \$30,000 is paid in cash, for the manufacture of mechanicals and molded goods, including rubber soles and heels for the shoe factory trade. F. P. Gowing, of the shoe supplies firm of H. H. Kelley & Co., Boston, is the treasurer, whose office is at 230 Purchase street, Boston. Louis H. Williams, who has had a wide experience in the manufacture of molded goods in Scotland and Canada and this country, is president, and will have charge of the manufacturing end of the business. His office will be at the factory, which is situated at 30 Locust street, Medford, Massachusetts.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE rubber factories continue to be among the busiest manufacturing plants in Rhode Island, and additional orders are being constantly received, notwithstanding that practically all of the concerns have more demands on their books than can be filled for some months to come. Many of the departments are, and have been for many weeks, working on overtime schedules and there would be even more machines operating in double shifts if there were men and women in sufficient numbers to work on them. There is not a single plant in the State that has enough help, it is said, and while improvements are being made in machinery and methods, it is not known where the extra help that will be needed is to come from, as repeated advertising in the newspapers fails to bring any material response. This shortage of help, together with the freight embargoes which are still in force to a greater or less extent, and some slight labor controversies, have somewhat handicapped the manufacturers, but these, in a measure, are adjusting themselves, and it is believed

that the year 1916 will be written into the history of the rubber industry of the State as one of the most prosperous ever experienced.

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With all the hustle and bustle incident to rush orders under far from favorable conditions and circumstances, however, the welfare of the operatives has not been overlooked or neglected. Rubber manufacturers as a rule have been prompt in taking advantage of every opportunity to better the working environment in their plants. The Woonsocket Rubber Co. maintains a fully equipped hospital for all emergency purposes, and a rest room that was established at the Alice Mill, at Woonsocket, early in 1915, and later similar accommodations were provided at the Millville plant. Miss Essie McDonald, a trained nurse, is on duty at the Alice Mill in the morning and at the Millville plant of the company each afternoon. She has full supervision as regards the health of the employees in both of these mills.

* * *

The most extensive welfare work done in Rhode Island in any industry, is that carried on at the National India Rubber Co.'s plant at Bristol, involving the expenditure of \$10,000 on one item alone, with a good many more thousands of dollars in the aggregate, and yet the plans are not fully developed. For a number of years there has been a steady effort made on the part of the National company to improve working conditions and to bring the operating force up to a high standard. Owing to the serious lack of housing accommodations, many of the employees reside elsewhere, not a few as far away as Providence and Fall River. For other reasons, it has often been necessary to hire persons almost as they stepped off the ocean liners in New York, few of whom had the remotest conception of hygiene.

The first problem in welfare work, therefore, was cleanliness, essential because of the character of the output. To obtain this there was a vigorous campaign waged, to the extent that in every department where white goods are handled personal neatness is now apparent.

The second step was to obtain satisfactory sanitary conditions, and for these it became necessary to give notice that spitting on the floor would be followed by instant dismissal—this was to pre-



DISPENSARY AND REST ROOM AT THE NATIONAL INDIA RUBBER CO.

vent tuberculosis infection. Inspectors were employed who could speak the various languages, and personal notice was served upon every employe that this rule would be enforced to the letter, and now the rule is rarely broken.

New, up-to-date toilet accommodations were provided in a

modern three-story building erected contiguous to the work-rooms, connections made by means of winding iron stairways, and additional fire escapes thus provided.

The next feature taken in hand was that of the hospital. This was located off the calendering room, where the liability of accidents is the greatest. It is finished in white, with tiled walls



SURGEON'S OPERATING ROOM AT THE NATIONAL INDIA RUBBER CO.

and floor, and equipped as an operating and emergency service room. On the second floor of the upper building, midway between the shoe and stitching room departments, where most of the girls are employed, is a cheerful rest room, in which there are two beds and a medicine cabinet. It is here that Miss Ruth Graham, a graduate nurse, who has general supervision of the health of the employes, has her headquarters.

Inability to provide suitable homes for expert sewers, has handicapped the company in obtaining the services of a sufficient working force. To overcome this trouble in part, the company took over the D'Wolf Inn, expending more than \$10,000 on repairs and for suitable heating and toilet arrangements, and opened this as a boarding house in April, 1915. As nominal board only is charged, the Inn is run at a loss. At present there are about 60 boarding at the Inn. The company has contributed a phonograph, but the girls pay for the hire of a piano. There are nights of reading and dancing and a competent instructor is training a class in gymnastics that the girls themselves have formed.

Following suggestions of those interested in welfare work, the company has installed a very expensive ventilating system for the workrooms and widened the passageways in, and those connecting the buildings, to a uniform width of 25 feet, thus providing for easy exit should there be occasion for hurried leaving of the shops.

The work of fitting up one of the rooms as a restaurant and lunch room for the employes has recently been finished, and good food is now being served at moderate prices. It is also proposed to fit up a room for recreation purposes, where the female operatives may enjoy themselves during the noon hour. This will be done as soon as accommodations can be obtained, and this may result in the construction of a special building for this purpose, as every foot of space now available at the plant is needed for manufacturing purposes.

In common with all the plants of the United States Rubber Co., the Revere Rubber Co. maintains a safety committee, composed of manager, master mechanic, superintendent and two others, which safeguards the employes from injury by applying protective devices to all machinery. It also looks after sanitary conditions and everything else that will conduce to the comfort

and advancement of the help. Special welfare work is done among the girl employes, individual drinking cups are provided, and a rest room is maintained. There is also a hospital, in which first aid is given minor injuries antiseptically treated. It is intended to place this work in charge of a trained nurse in the near future, and to establish a recreation room. No lunchroom is provided, for the reason that it is required that all shall leave the premises at noon, that the rooms may be thoroughly ventilated and conditions for the afternoon work made better. Tennis courts are maintained for the free use of the employes during the noon hour.

* * *

I. Victor Stone, chief chemist at the Revere Rubber Works, Valley street, has taken possession during the past few days of the new laboratory that the company has recently finished in addition to its plant on Eagle street. This addition is said to be one of the most complete and up-to-date of its kind in the country.

* * *

The Washburn Wire Co., of Phillipsdale, has begun dredging operations in the Seekonk river, preparatory to the building of a dock at the plant. In the past the company has received its water shipments from a dock owned by the American Electrical Works. This method has entailed much handling, which will be eliminated when the proposed wharf is completed. Other improvements are being made or are in contemplation at the plant of the Washburn Co., and will be commenced at an early date.

* * *

Julian A. Read, of this city, has been appointed executive secretary and accountant of the Kansas City Tire and Rubber Co., at Kansas City, Mo., and will make his headquarters there with P. A. Werner, organizer of the concern. The concern has also recently taken over a plant at Chester, West Virginia, which is to be a subsidiary.

* * *

Edward L. Viets, of Detroit, State agent for Michigan for The B. F. Goodrich Co., was a recent visitor in this city in the interests of his concern.

RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

THE demand for automobile tires is reported as unprecedented in the local factories. It is estimated that more than eight hundred thousand tires will be turned out before the coming season has closed. The total payroll of the tire manufacturers is now \$3,000,000 a year. This sum will be considerably increased, according to plans under way for next season. One factory will fall 10,000 tires short of filling the orders it has already booked.

It is possible that some of this business is due to users anticipating their tire wants in view of the expected increase in prices in the near future, but, in the main, it is but the reflection of a normal healthy growth. One Trenton firm by working every department to capacity on day and night shifts has been able to get ahead of orders, and it is said this company has made up several carloads of tires which have been placed in storage. These will be held for the better prices which will undoubtedly be obtained within the next few months.

Zinc oxide, it is said, will be at a much higher figure within a few weeks and at the present rate of increase the price will be almost prohibitive in mid-season if the present war conditions continue. Red oxide of iron is being substituted for antimony as a coloring agent for red tubes and tires, but even this is becoming steadily more scarce and it looks as though the gray product will have the call almost exclusively.

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Among the concerns filing charters with the Secretary of State in April is the Dayton Tire Co., of New Jersey. Head-

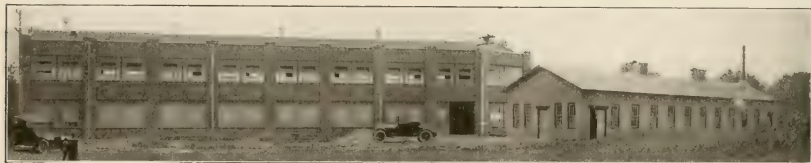
quarters, Newark. The concern, as the name indicates, is to manufacture automobile tires. Accessories will also be turned out. The capital stock is \$10,000. The incorporators are: Nathan Schwartz, Belleville; Fred D. Rausler and I. G. Farmer, Newark.

The Trenton Chamber of Commerce is negotiating with a company of New York capitalists who are considering the advisability of locating a factory here for the manufacturing of a popular-priced car, not yet on the market. The names of the promoters are being kept secret pending the negotiations.

Finishing touches are being put upon the \$20,000 addition to the plant of the Thermoid Rubber Co.

Samuel McDonald, who resigned his position as salesman for the Acme Rubber Manufacturing Co. some time ago to open a tire salesroom in Trenton, has again taken a position with the Acme.

The Zee Zee Rubber Co., which has begun the making of "Brazilian" tubes in its new plant at Yardville, a few miles south of Trenton, has already seen the necessity of practically tripling the present capacity of the plant by additional buildings, although the mortar has scarcely had time to dry in the plant now occupied. The new addition will be erected at once.



NEW FACTORY OF THE ZEE ZEE RUBBER CO., YARDVILLE, NEW JERSEY.

The story of the Zee Zee Rubber Co. is interesting. About eleven years ago Irvin Zimmerman, the president of the company, was a banker and broker in Philadelphia. He determined to go into the automobile tire business and formed a selling company with his brother as a partner. Their original stock of tires, made under their brand in a Trenton factory, was worth about \$3,000. Such was the beginning. When it is stated that last year this company sold \$1,500,000 worth of tires and didn't even have its own factory, the statement will probably be rated as remarkable. But it isn't so remarkable when one knows Irvin Zimmerman, a man who fairly radiates "pep" and who gives the impression that he could start a garage in Venice and get rich at it. He is a born salesman, and under his business methods the Zee Zee output is sold far into the future. There are now 400 branch salesrooms for the Zee Zee tires and tubes. About 60,000 autoists are regular users.

The company expects to be making tires in its own plant by July. According to the plans of the concern, 3,000 tubes and 800 tires a day will be turned out when the new building is completed and all the machinery installed, and 180,000 feet of floor space will be occupied.

The Detroit, Michigan, office of the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, formerly at 1201 Woodward avenue, has removed to 1109 Kresge building.

WESTERN TRADE NOTES.

THE Southwestern Tire-Manufacturing Co., whose incorporation was noted in the April issue of THE INDIA RUBBER WORLD, has secured a factory site in Oklahoma City, Oklahoma, and will begin the construction of its plant this month. The officers of this company are as follows: John L. McClelland, president; Charles W. Gunter, vice-president; W. E. McClelland, secretary, and C. H. Everist, treasurer.

The Denver, Colorado, branch of the Fisk Rubber Co., Chicago Falls, Massachusetts, has been removed from 1635 Broadway to a new building at 1168 Broadway, constructed with large space for service use.

A. L. Devault, formerly manager of the Detroit, Michigan, branch of the Federal Rubber Manufacturing Co., of Illinois, has been transferred to Chicago as manager of the central district, with headquarters at the Chicago Warehouse, 1434 Michigan avenue. Mr. Devault entered the rubber business in 1905, with the G. & G. Tire Co., Detroit, finally being given charge of that branch, and still later becoming special representative for the United States Tire Co.

J. G. Smith has been appointed manager of the Dallas, Texas, branch of the Pennsylvania Rubber Co. of New York. Mr. Smith has been connected with the Pennsylvania company for the

last eight years, being, for the past three years, with the selling organization at the Atlanta, Georgia, branch.

J. W. Wildman, formerly with the New York branch of the Portage Rubber Co., Akron, Ohio, has been made manager of the branch at Des Moines, Iowa.

The United States Rubber Co., Detroit branch, is the name now given to the consolidation of two branch stores of this company which were previously known as the Detroit Rubber Co. and the Hub Mark Rubber Co. This concern will continue at 81 and 83 Jefferson avenue, carrying the lines formerly carried by both branches. There will be no change in the management, both A. H. Crum and J. C. Huff being connected with the agency.

O. S. Johnson has been placed in charge of sales and service in Detroit, Michigan, as branch manager for the Gibney Tire & Rubber Co., Conshohocken, Pennsylvania; H. L. Winter, formerly Detroit branch manager, having resigned. Mr. Johnson was formerly with the United States Tire Co. as district manager.

The Banigan Rubber Co. and the Standard Rubber Shoe Co., Chicago, Illinois, have consolidated, operating under the latter name, with J. J. Hawkins as president and E. C. Yarnell as treasurer.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

BUSINESS at the works continues brisk, both for government account and private orders, but the all-absorbing topic is how to get the work done with the continual withdrawal of men for military service. Comparatively few of the applications to the tribunal for the total exemption of men have been granted and works managements have been compelled to fall back more and more upon the services of women. With regard to this change, the managing director of a large works tells me that the effectiveness of the substitution has been an eye-opener to him, more particularly with regard to the volume of work turned out. In fact, it seems to be the general result that women have proved efficient in the various forms of manual labor to which they have been introduced for the first time, while the results have been by no means so satisfactory where they have replaced men in office and other clean-hand work, this being probably accounted for by the fact that the recruits come from somewhat different social strata.

THE NEW BUDGET DISAPPOINTING.

The new budget is mainly of home interest and, much to the disgust of fervent tariff reformers, there are no new import duties, which are naturally the main interest for foreigners. The considerably increased duties on motor cars, coupled with the market rise in the price of petrol, will probably have some effect, but not much on the demand for tires, pleasure motoring having fallen off already to a great extent. The value of tires, tubes and accessories for motor cars imported from America from October 1 last to February 29 is stated officially to be £912,397 plus £4,365 for motorcycle tires. It will be remembered that the import duty proposed in the last budget on these goods was abandoned, though it was retained on motor cars. Ford motor cars, which formerly paid a license of £6, will now have to pay £18 under the new budget.

BELTING QUALITIES CRITICISED.

The old controversy as to the respective merits, as regards strength and longevity of Brazilian Para and plantation Para, was renewed in the discussion of Mr. Tinto's paper on rubber and balata belting before the Manchester Association of Engineers. Mr. Bentham expressed the opinion that the rubber belting of 30 or 40 years ago, made from wild rubber, could not be obtained today, because plantation rubber was being used in place of the Brazilian rubber, which was now practically exhausted. Quite probably the speaker was correct in saying that the average rubber belt, as indeed the average compounded rubber article, is not today equal to what was obtainable in earlier days of the manufacture before competition among makers became keen, but this matter of belting is not one in which the relative lasting values of the two rubbers can be summarily determined without careful consideration of many details of the manufacture, and I have reason to suppose that this view is supported by the author of the paper. Mr. Bentham, I may say, is an engineer of wide experience and holds an important position, but he is not a rubber manufacturer. With regard to the statement that the wild rubber of which belts were formerly made is now practically exhausted, if this is meant, as is presumably the case, to refer to Fine Hard Para, I fancy that our friends in Brazil would be inclined to disagree.

CLOTHING WORKERS' WAGES INCREASED.

An agitation among waterproof garment workers in the Manchester district for an increase of pay has led to the increase being granted in practically all cases. This branch of the trade remains fully employed, and it would be a serious matter if any stoppage occurred. At the same time, although the manufac-

turers have perforce all come into line, it must not be assumed that they all see, eye-to-eye, the necessity for, or advisability of, this concession.

A QUESTION OF HONESTY OR ETHICS.

Some time ago I referred to the sale in one shop of "The Kleenquick" eraser, made entirely of substitute and mineral matter. I must say that it answers its purpose very well and does not get soiled on the rubbing surface as does ordinary india rubber when left lying about. A question of ethics, however, arises in the sale of it as india rubber, as it has come to my knowledge that compositions of the sort are supplied to buyers at shops who ask for a piece of rubber without any explanation as to the fact that it is not india rubber. The problem is a knotty one because it would doubtless be easy to show that various goods supplied as made of rubber, have frequently contained that substance in but infinitesimal quantities. It might be argued successfully that as it rubs out pencil marks with ease and completeness, the buyers' expressed wants are filled, despite the fact that the composition is different from what has been supplied in the past.

SHORT TRADE NOTES.

It is one thing to get out plans for the extension of works and another to get the work done in these days of labor shortage. Thus it is not surprising that delay has been experienced at the large new works of the Dunlop Rubber Co. at Bromford, near Birmingham. Another firm whose large extensions are making but slow progress is the Premier Waterproof & Rubber Co., Limited, of Danzig street, Manchester.

J. V. Worthington, general manager of the Dunlop Rubber Co., has been appointed a director both of this company and the parent tire company in place of Sir W. G. D. Goff, Baronet, one of the original Irish directors, who has retired from business. The new director is a qualified medical man who took the somewhat unusual step of leaving the profession to go into commerce, where he has been a recognized success and proved popular with the large numbers under his control.

Among the alien enemy companies recently wound up by government order is the Continental Tyre & Rubber Co. (Great Britain) Limited, South Kensington, London, and the Polack Tyre & Rubber Co., Limited, Shepherd's Bush, London.

The vulcanite manufacture has been taken up, as regards various articles, by several rubber manufacturers, and an extension of the home manufacture is to be seen in the case of certain firms using vulcanite in their businesses. For instance, a large firm of tobacco pipe manufacturers, who, when former supplies of vulcanite from Germany were cut off by the war, got its requirements filled by home manufacturers, though at a considerably higher price, has installed machinery made by one of our leading rubber machinists and is now turning out its own vulcanite.

A novel contract has been made between the Bradford Tramways Committee, Bradford, and the Dunlop Rubber Co., Limited, Birmingham. The latter agrees to furnish rubber tires for railless street cars for two years from February, 1916, at 75d (134 cents) per mile run per vehicle.

Your correspondent has been informed that an item in the February issue of THE INDIA RUBBER WORLD regarding a position of commercial manager at the works of the Leyland & Birmingham Rubber Co., Limited, Leyland, England, was incorrect. The position, which was made vacant by the death in active service of Lieutenant Colonel Fallows, has been filled by the

appointment of George Anderson, a departmental director of the company and formerly joint manager of its Glasgow business.

The British Board of Trade is in receipt, through the Foreign Office, of information to the effect that exportation from Norway of all manufactures of rubber, gutta percha and balata is prohibited, with the exception of driving and transmission belts of balata and gutta percha.

ANTI-RUST INNER TUBE.

The Stepney Spare Motor Wheel, Limited, London, has introduced on the British market a new type of inner tube for automobile pneumatic tires consisting of an ordinary air tube having around its inner circumference, where it is slightly thicker than the tread, a band of rubber which it is claimed prevents the rust from the rim injuring the rubber tube. It is also well suited for use on wire wheels owing to the fact that its shape before inflation protects it from damage by the spoke heads when being fitted in the casing.

Another feature of this tube provides what is termed a "tropical" joint, which, before curing, is treated with special solution and is claimed to be thus rendered immune from overheating when in use.

RUBBER EAR PLUG.

Though very similar in some respects to the ordinary ear protector, this recent invention has several novel features to command attention and interest. In the illustration on the right the protector is to be seen by itself, while on the left it is shown as it appears when fitted to the ear.

The plug or protector consists of a ball *A* made of flannel, silk or rubber, slightly tapered to fit the outer ear passage. This plug is attached to the end of the small screw *C* that is set at an angle of 45 degrees and threaded through the anchor piece *B*.

When the plug is in place the screw is turned by the milled head, which causes the plug to move both forward and sideways to suit the size and shape of the ear. Thus it can be adjusted to fit any ear, whereas other ear plugs must be made to fit each different size of ear. A cap of vulcanite, celluloid or rubber is used to cover the plug. A ball made of vulcanite, celluloid or rubber may be used in place of the flannel, silk or soft rubber. [T. N. Atkinson, 26 Hart street, Holborn, London, W. C., England. British patent No. 4,579 (1915).]

BRITAIN PROHIBITS AUTOMOBILE IMPORTS.

At a meeting of the privy council of Great Britain, King George signed a proclamation prohibiting the importation of automobiles, motorcycles and various other articles. This prohibition has been expected for some time, and is understood to be for the purpose that shipping may be free to carry necessities for which the need is urgent. It is pronounced in logical sequence to the imposition of the 33½ per cent duty placed upon automobiles by the British government last October. It is understood that the prohibition does not apply to motor trucks or vehicles to be used solely for commercial purposes.

NEUTRAL EUROPE NEEDS TIRES.

Diplomatic representatives of the United States in Holland and Scandinavian countries have brought to the attention of the state department the difficulties encountered by automobile dealers and users in those countries, through shortage of tires. The agreement between the British Government and American manufacturers of rubber goods has resulted in forcing the automobile and tire dealers to buy all their tires through British dealers, and this has caused greatly increased prices, and in some cases inability to purchase tires at any cost.

THE SITUATION IN FRANCE.

By Our Regular Correspondent.

THERE is little to report from this country that would be of real interest to readers of THE INDIA RUBBER WORLD. We are all heart and soul in the war, our thoughts are on Verdun which is successfully resisting the most formidable, the most terribly scientific and powerful onslaught that ever was waged in war. A gigantic struggle like this is consuming tremendous quantities of rubber goods, tires especially. Practically all ammunition en route to the battle front and all the men traveling to and from the fighting lines are transported over great distances by vehicles equipped with rubber tires. The motor car has revolutionized warfare. Railways no longer have the importance they had in the great wars of the past. Motor trucks on our roads can do all that the railroads can and much more. We have solved the tire problem and are now obtaining very good mileages from the solid kinds which gave much concern at the beginning of the war. Our greatest motor-truck troubles of late have been with anti-skid devices on which there is much room for improvement. All our military trucks are provided with non-skid devices but they unfortunately are often lost just when they are required. The work of fitting non-skid chains is not easy when the man has but little experience and the thermometer is a dozen degrees below zero. Then, frequently, when the chauffeur endeavors to apply his non-skid chains he finds them perhaps a foot too short or too long. Drivers are reluctant to use non-skid chains but many have learned by experience that it is costly to do without them.

THE TIRE INDUSTRY.

Our rubber manufacturers are still able to supply our civil and military demands in the way of tires, as well as a fair portion of the requirements of our Allies. Only recently the Société des Etablissements, Bergougnan, Clermont-Ferrand, secured a contract for 25,000 solid rubber truck tires for the Italian Government and is now working on this important order having increased its manufacturing capacity to more than 900 solid tires per day.

SPORTING GOODS.

Business in rubber balls and sporting goods continues to be fairly good, thanks to the efforts of our athletic associations and publications. The army has been kept well supplied with these healthy means of recreation. Football matches are organized weekly and a large portion of the gate receipts are devoted to purchasing balls for the troops. The Paris representative of the American firm of A. G. Spalding & Bros. has been conspicuous in donating footballs, each to be used for one match and then turned over to the army. At a recent match in Paris a rugby football team of the American Ambulance, in Neuilly, was opposed to a team made up of available first-class players of Parisian clubs, and a goodly sum was raised for purchasing sporting goods for the soldiers.

SYNTHETIC RUBBER.

Our rubber men have followed with interest the writings of the German press on the subject of synthetic rubber and the progress alleged to have been made towards the solution of the problem. Of course we are skeptical when we read that the problem has been solved, and we have good reasons to be so. Writing on this subject your Paris contemporary "Le Caoutchouc & la Gutta-Percha" makes a few pertinent remarks, saying in substance: "They claim that a factory in Frankfurt is making pneumatic tires from this new material which is sufficiently durable to be used for the same purpose as natural rubber. The process is secret, but Professor Memmler, of Berlin, says that the product is the result of several years experimenting and that it is satisfactory."

"In the course of the past seven or eight years, we have been asked on an average twice each year, to publish a statement

similar to this. In the present instance, we have no information other than that contained in a general article prepared for the press, giving no details of the process. Usually in such announcements, particular stress is laid on the low cost of production of the synthetic product, and it is worth while to note in this connection, the omission of all reference to the cost of production.

"Synthetic rubber is not a new discovery; it can perfectly well be made in a laboratory, but its production on a commercial scale has not yet been attained.

"It is evidently quite possible for a process to be economical in war time when one has to pay 21s. per pound for natural rubber, while the same process could not be countenanced in time of peace. The allusion to several years experimenting may merely indicate the development of one of the well-known patented processes.

"Another point worth noting is the indication concerning the lasting quality of this rubber; it is 'sufficiently durable,' etc. If all difficulties had been overcome a more energetic term would certainly have been used."

PERSONALS.

Baron de Wissocq, head of the Etablissements Hutchinson, serving as captain in the army, has been promoted to the rank of major and made Knight of the Legion of Honor.

Count R. de Fleury, a well-known rubber authority and contributor of your contemporary "Le Caoutchouc & la Gutta-Percha" is serving as a lieutenant of artillery.

Captain Rouxeville, the noted rubber chemist, recently returned to the front after a rest necessitated by wounds suffered in battle.

André Dubosc, chemical engineer and authority on rubber manufacturing, has returned from an extensive American trip.

TRADE NOTE.

Rousselot & Cie, Paris, manufacturers of chemicals, are installing a plant that will produce 220 pounds of golden sulphure of antimony per day.

ACCUSED OF TREASON.

The barbarities in the Putumayo district are again brought to mind by the arrest and incarceration of Sir Roger Casement, who is now in military custody, having been captured when a German auxiliary was sunk, which was attempting to land arms and ammunition in Ireland for use against the British Government.

It was in 1910 that the stories were published of horrible atrocities perpetrated on the rubber gatherers in the Putumayo district in South America. Sir Roger Casement was then Consul-General at Rio Janeiro, and the British Government sent him to investigate the truth or falsity of the story. After spending several months in the interior, he reported that the accounts of the barbarities were not exaggerated.

After years of service in the British Government, holding offices of honor and responsibility, and having been knighted and having bestowed upon him medals and decorations, it is alleged that he has endeavored to arouse the hatred of the Irish, and that he has conspired with Germans against Great Britain.

HOLLAND.

The offices of the Amerikaansche Handelsmaatschappij, conducted by J. Polak Grödel, in Amsterdam, representatives of the United States Rubber Co., Everlastik Inc., and several other well-known firms, have been removed from their old location—Prinsengracht 544—to new quarters at Marnixstraat 402A, in the same city.

Owing to the shortage of rubber in Germany, it is stated, on the authority of the managing director of a large rubber company who returned recently from Berlin to Stockholm, that nearly all the taxicabs in Berlin have steel tires, and that steel tires are also in use on cars at the front.

EUROPEAN TRADE NOTES.

SWEDEN.

The Swedish Government is taxing all exceptional profits that are deemed to be due to extraordinary conditions developed by the war. The War Profit Tax Administration in Stockholm, which has the task of estimating these war profits for taxation, recently published a general list from which were obtained the following names of dealers in rubber goods, together with the amounts upon which each will be obliged to pay as war profit taxes: Wahlen & Block, wholesale dealers in rubber mechanical goods, 23,700 crowns [\$6,352]; Aktiebolaget Axel Christiernsson, wholesale dealers in rubber mechanical goods and general factory supplies, 256,400 crowns [\$68,715]; and Aktiebolaget Andersson & Pohl, wholesale dealers in scrap rubber, 18,000 crowns [\$4,842].

The Aktiebolag J. R. Broman & Co., wholesale dealers in mechanical rubber goods, packings, beltings, etc., 17 Lilla Nygatan, Stockholm, has declared a dividend amounting to 10 per cent.

DENMARK.

Statistics recently published show that the number of automobiles in Denmark on September 1, 1915, was 4,331, as against 3,430 machines at the corresponding date in 1914, and 682 in 1909, when the first statistical information regarding automobiles was published by the Kingdom. Of the total number of machines on September 1, 1915, 3,773 were for passenger use; this number included 1,291 used for cabs or omnibus service. Motor trucks numbered 558. At the same date there were also 6,347 motorcycles in use.

EXTENSION OF EUROPEAN EMBARGO ON EXPORTS OF RUBBER GOODS.

SWEDEN.

The Swedish Government has extended its export embargo to include soles for shoes made of rubber and fabric, and belting made in whole or in part of rubber, gutta percha or balata.

NORWAY.

A recent circular of the Norwegian Foreign Office places an embargo on all exports of rubber goods; also all goods made whole or in part of balata and gutta-percha, with the exception of belting.

ITALY.

The Italian Government has prohibited all commercial intercourse with the German Empire both for Italy and its colonies. Further, an export embargo has been placed on all rubber, balata and gutta percha goods, all waste materials and scrap from which rubber may be reclaimed. Benzine is also on this list.

NORTHERN FREIGHT ROUTE TO OPEN.

American exporters will shortly have an opportunity to land goods in Russia without delay from pressure of government shipments. The American-Russian Chamber of Commerce, 60 Broadway, New York City, has received a cablegram from the Russian-American Chamber of Commerce of Moscow announcing that the Pacific port of Nikolaevsk, at the mouth of the Amur River, Siberia, will be opened for navigation June 14. American exporters wishing to avoid the congestion and delays in sending freight by way of Vladivostok should direct shipments to Nikolaevsk. Goods received there will be transported up the Amur River to Stretynsk, where connection is made with the railroad system.

RUBBER IMPORTS INTO AUSTRALIA.

The British Trade Commissioner for Australia has prepared interesting tables illustrating the share of the United Kingdom, the United States and British Dominions and possessions in the importation of "competitive merchandise" into the Commonwealth of Australia during the year ended June 30, 1916.

Under the heading "India Rubber, and manufactures of," out of total imports from all countries amounting to £481,811 [\$2,344,733] Great Britain's share was £214,929 [\$1,045,925], the United States ranked second with £118,669 [\$577,503], while the share of the British Dominions and possessions was £36,703 [\$178,615].

THE RUBBER TRADE IN GERMANY

By Our Regular Correspondent.

PERHAPS the most interesting development here since my last communication is the revival of interest in preparations for the commercial and industrial struggle that is sure to follow this terrible war. The Berlin Chamber of Commerce recently held a general meeting, at which this important subject was discussed at length. The representative business men who attended were unanimous in their belief that measures of preparation should be taken immediately and that adequate quantities of raw material should be purchased—without haste, but as soon as practical—to be held in neutral countries for shipment to Germany as soon as the war ends. All were of opinion that if peace comes before German interests have been able to secure such supplies of raw materials as this country will need, the prices that will be demanded for these materials will be prohibitive, even though our enemies may not attempt to place obstacles in the way of our industries, a course they may decide to adopt.

RUBBER TRADE.

Uncertainty is the characteristic of our rubber trade at the present time. No one knows how high prices will be tomorrow nor is anyone sure of being able to get goods at all. Prices are constantly advancing and further articles are being added daily to the list of those no longer obtainable. Dealers have to take practically what they can get, and are often obliged to sell with little or no profit. When prices are communicated to the dealer he finds them excessive, and sets about to see if others are not offering better prices and conditions than those of his regular supplier. By the time he discovers that the prices quoted were right and sends in his order, prices have again advanced and he has no remedy because all quotations are made subject to change without notice.

Both dealer and manufacturer have much to contend with in the way of complaints about the quality of merchandise. Consumers appear to be unable to grasp the fact that war qualities cannot bear the same guarantees as standard peacetime goods, and their distrust and discontent are often increased by the acts of competitors who are able to include standard quality goods in their deliveries. These peacetime manufactures give much better service than the war qualities and, of course, this starts real trouble. The dealer cannot get any redress from the manufacturer, so he is left to adjust matters with consumers, who rarely are disposed to understand and accept his explanations.

Manufacturers also have their troubles. They do their very best to satisfy all needs and then have no small difficulty in inducing dealers to recommend the fruit of their efforts.

RUBBER NIPPLES.

It is practically impossible to comply with health laws and supply rubber nipples under the present conditions. Substitute qualities contain prohibited substances and cannot be used. Recently the Government released a certain amount of crude rubber to be used exclusively for making nipples, but the quantity was inadequate to supply the demand and prices are becoming prohibitory on an article that is essential and is used by the poor in greater quantities than by those who could better afford to pay.

NATIVE RUBBER-YIELDING PLANTS

Certain people bidding for notoriety have created considerable excitement by stating to the press that a plant indigenous to Central Europe yields a higher percentage of pure rubber than any other plant, and that its cultivation would render Germany independent for her supplies of crude rubber. All this is but a revival of the attempt to exploit the "*Lactuca ziziminea*" a few years ago. It is interesting from a botanical

point of view but of no commercial value. Our chemical factories are producing better rubber than any weeds of the Danube or Elbe valley can supply, and there are good reasons for the hope that they will soon be able to produce it in quantities that can never be expected from our native "rubber vegetables."

EXPORTS TO NEUTRAL COUNTRIES.

Our manufacturers have been facing many difficulties in exporting to such neutral countries as are still accessible to us. The chief cause of complaint is the delay experienced in obtaining export permits. The matter has been taken up with the Government by the "Permanent Committee of German Export Associations," and it is hoped that some relief will soon be secured. These difficulties do not directly affect our rubber industry, which is not generally in a position to export, but they do so indirectly because rubber manufacturing is concerned, to a greater or less extent, in the prosperity of almost all branches of industry.

LEIPSIK FAIR.

The Leipzig Easter Sample Fair was held as usual and the rubber industry was well represented. This was the fourth sample fair held at Leipzig since the outbreak of the war, and was pronounced the most successful.

STATE MONOPOLY OF MECHANICAL POWER.

It is now clear to everyone that the tremendous cost of this war can never be paid for by ordinary or even extraordinary taxation, and many believe that the creation of government monopolies will best solve the problem. It has been suggested that the government be given the monopoly of mechanical power. This would certainly lead to the high development of water power and electricity and would thus result in great benefit to our own as well as all other industries.

CONFISCATION OF TEXTILES.

The law requiring the confiscation of certain supplies of textiles includes duck, or canvas, and drills, also burlaps, all of which are extensively used in our rubber industry. These measures were not taken because the country's supplies are coming to an end. Quantities on hand are sufficient to last for a long time yet. The confiscation is but another instance of the government guarding against any emergencies that may occur, especially as the duration of the war is uncertain.

TRADE NOTES.

Fire broke out recently in the works of Dr. Traun & Söhne (formerly Harburg Rubber Comb Co.) in Hamburg. Prompt action on the part of the employees and the city fire brigade limited the damages to one department in which, however, the loss amounted to over 100,000 marks [\$23,800]. The stock of rubber, fortunately, was not damaged.

Otto Werner, of Canstatt-Stuttgart, one of the owners of the great Werner & Pfleiderer organization, on the occasion of the birth of his first son and heir, donated 50,000 marks [\$11,900] to needy employees in Stuttgart and 20,000 crowns [\$4,060] to such employees in Vienna.

The Excelsior Rubber Works, Hanover, report that 1,000 of their employees and workmen are at the front. Fifty-five have received the Iron Cross for conspicuous bravery and 66 have died on the field of honor.

RUBBER COMPANY DIVIDENDS.

The Asbest und Gummiwerke, Alfred Calmon, A.G., Hamburg, has declared 6 per cent dividend.

A 30 per cent dividend was declared by the Continental Caoutchouc und Gutta Percha Compagnie, Hanover.

The Hanoversche Actien Gummiwaren Fabrik, Hanover-Linden, declared a dividend amounting to 10 per cent.

The Middledeutsche Gummiwarenfabrik Louis Peter, A.G., Frankfurt-on-the-Main, and the Norddeutsche Gummi und Gutta-Perchawarenfabrik (formerly Fanrobert & Reinmann, A.G.), Berlin, each declared a 4 per cent dividend.

A dividend amounting to 6 per cent and one amounting to 11 per cent were declared by the Gummiwerke Elbe, A.G., Klein-Wittenberg, and by the Mannheimer Gummi, Gutta Percha und Asbest Fabrik, A.G., Mannheim, respectively.

The Norddeutsche Jutespinnerei und Weberei, Hamburg, spinners and weavers of jute for the rubber and other industries, have declared 8 per cent dividend.

RUBBER COMPANIES SUBSCRIBE TO FOURTH WAR LOAN.

The Continental Caoutchouc und Gutta-Percha Compagnie, Hanover, together with its employees, have subscribed over 5,000,000 marks [\$1,190,000] to the fourth war loan, making the total contributions of this organization to war loans more than 15,000,000 marks [\$3,570,000].

Felten & Guillaume Carlswerk, A.G., Cologne-Mülheim, have subscribed 3,000,000 marks [\$714,000] to the fourth war loan. The Guillaume family, privately, has subscribed 5,000,000 marks [\$1,190,000] to this same loan.

The Excelsior Rubber Works, Hanover-Linden, has subscribed 1,000,000 marks [\$238,000] to the new war loan.

Gebrüder Feisenberger, wholesale dealers in rubber footwear, Frankfurt-on-the-Main, and the Liga Gummiwerke, Frankfurt-on-the-Main-Hausen, subscribed 300,000 [\$71,400] and 100,000 marks [\$23,800], respectively.

AUSTRIA-HUNGARY.

Austrian and Hungarian rubber manufacturers have added 150 per cent to their prices for mechanical rubber goods and placed another 50 per cent advance on their last prices of asbestos goods.

The Hungarian Government has suspended its order requiring the registration of all supplies of crude rubber and automobile tires.

SIAM'S IMPORTS OF AMERICAN AUTOMOBILES.

Siam imported 76 American automobiles in the fiscal year 1913-1914, and only 25 during the fiscal year 1914-1915. These imports formed 40 per cent of the total number of automobiles imported in 1913-1914, and 33 per cent in 1914-1915. In value, imports of British and German automobiles exceeded those of American cars. The total value of the 101 American machines imported during the two fiscal years referred to amounted to \$73,945, the average value per car being \$728. During 1913-1914 and 1914-1915 Siam imported, from all sources, of automobile parts to the value of \$53,526.

PERUVIAN IMPORT DUTY ON TRANSMISSION BELTS.

The Peruvian Government has placed an import duty of 10 per cent ad valorem on transmission belts of cotton or hemp, of leather or of rubber. Hitherto such belts have been exempt from import duty.

RUBBER ON THE EAST COAST OF SUMATRA.

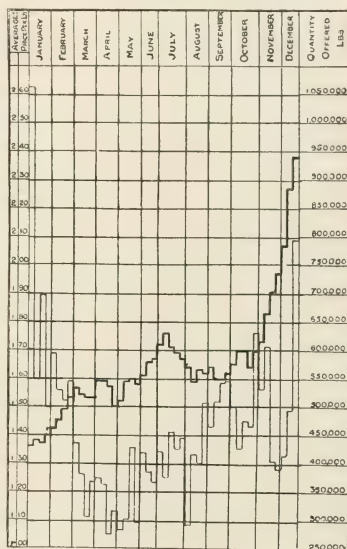
The growth of the rubber plantation industry on the East Coast of Sumatra in the past 10 years has been remarkably rapid. From 3,305 acres in 1905, rubber plantations grew to cover 73,826 acres in 1910, and 245,000 acres in 1914, when the last census was taken.

In the Tamiang district of Sumatra rubber plantations only date back to the boom in 1909, when a start was made with 2,250 acres. Today the plantations cover more than 14,000 acres.

The crude rubber exported from the East Coast and from

the Tamiang district of Sumatra includes plantation sorts (*Hevea* and *Ficus*), and also wild rubber of the *Ficus elastica* genus.

DIAGRAM SHOWING THE WEEKLY RISE AND FALL IN THE PRICES AND QUANTITIES OF RUBBER (ALL GRADES) OFFERED AT LOCAL AUCTIONS HELD IN CEYLON DURING 1915.



Compiled by the Ceylon Chamber of Commerce.

THE LIGHT LINE DENOTES THE QUANTITY OFFERED FOR SALE. THE HEAVY LINE DENOTES THE AVERAGE PRICE PER POUND REALIZED.

SINGAPORE RUBBER AUCTIONS.

At the annual general meeting of the Singapore Chamber of Commerce, which was held in February, it was stated that 51 rubber auctions had been held during the year 1915, and, of a total of 27,010 tons of rubber exported from Singapore in that year, 7,322 tons were sold at these weekly auctions. The amount of rubber disposed of at private sale was still considerable, but the proportion of the total business embraced by the auction sales showed steady increase. Prices obtained at the auctions were reported most satisfactory, and in the great majority of cases compared favorably with London values ruling at the same dates. The highest prices realized were: 204 Straits Settlements dollars per picul (about 87 cents per pound) for ribbed smoked sheet, and 209 Straits Settlements dollars per picul (about 90 cents per pound) for fine crêpe, as compared with 141 and 146 Straits Settlements dollars per picul (about 58 and 61 cents per pound) respectively, in 1914.

The Chairman confidently anticipates that in the future Singapore would steadily increase its influence in the crude rubber market.

Rubber Planting Notes.

CRUDE RUBBER EXPORTS FROM FRENCH INDO-CHINA.

THE latest available official statistics regarding crude rubber exports from French Indo-China are for the calendar year 1914, and show that the total of these exports for the period covered amounted to 180,692 kilograms [397,522 pounds], and were distributed as follows:

France:—	
Plantation rubber	Pounds 297,161
Wild Forest rubber	" 79
Singapore:—	
Plantation rubber	Pounds 100,283

Compared with 1913 these figures show a decrease of 66,000 pounds in the exports of plantation rubber to France and a decrease of 8,800 pounds for the same exports to Singapore. The year 1913 was, however, exceptional, for the plantation rubber exports to Singapore amounted to 99,000 pounds against 13,200 pounds in 1912. The decrease in the plantation rubber exports to Singapore during 1914 was due to the fact that the great Michelin company of France bought up the whole output of one of the largest plantations of Indo-China.

However, the fact remains that the war has injuriously affected the plantation rubber industry in French Indo-China. The measures of financial conservation which the Allies took from the very beginning of the war prevented the sale of plantation shares on European markets and, as reported in THE INDIA RUBBER WORLD for February, 1916, many plantations would have been obliged to abandon operations had the local government not been able to negotiate loans through the Banque de l'Indo-Chine for the benefit of those *Hevea* planters most seriously affected. These loans accomplished great good, because they were timely and were allowed only after careful investigation of both the planting and the financial condition of the plantations.

DIFFERENCE IN QUALITY OF HEVEA LATEX.

A rubber expert writing in the "Monthly Bulletin of Agricultural Intelligence and Plant Diseases" is of opinion that the properties of *Hevea* latex vary according to the tree from which it is obtained, and he bases his opinion on determinations of viscosity of rubber in solution in benzene. He made up an index of viscosity, and discovered large differences among the individual trees yielding the rubber. This expert also believes that there is a correlation between the color of the latex and the quality of the rubber obtained from it. It would appear that these observations are of use in the selection of seed-bearing trees.

EXPERIMENTS FOR PREVENTING THE BARK ROT DISEASE OF RUBBER TREES.

The Progress Report of the Peradeniya Experiment Station, Peradeniya, Ceylon, contains interesting reference to experiments conducted at that station for preventing the development of the bark rot disease of rubber trees.

The newly tapped surfaces of the trees are covered with a thin coating of a mixture made by boiling 1 ounce of sulphur in half a kerosene tin [2½ gallons] of water and adding equal parts of animal compost and clay till a thick paste is obtained. A pinch of salt is added to keep the paste moist and prevent cracking and peeling off from the tree. The object of this treatment is to protect the exposed delicate, cambium layer from sun and drying winds, as a precaution against the bark rot, and to encourage good bark renewal. The experiments proved it to be advisable to apply this treatment monthly during the dry weather to within a quarter of an inch of the tapping area.

RUBBER IN BURMA.

For years past the government of British Burma has been undecided as to the revenue which the rubber industry there ought to yield to the Provincial Exchequer and the longstanding discussion as to the extent of the government's share has materially retarded the industry.

Most of the plantations are on leased lands, paying a rent to the government; and all along there appears to have existed a feeling that, in addition to the rent, the rubber planters, whether private individuals or limited companies, should pay something additional either in the form of a royalty or as an export duty, as is done in Ceylon and elsewhere.

Recently a deputation representing the Upper and Lower Burma Planters' Association called upon the Lieutenant-Governor and views of the situation were interchanged.

Among the suggestions made, one, that is most likely to be acceptable to both the local government and the planters, proposes that the latter pay an equitable rent for the land under rubber and a further contribution based on the selling price of rubber in London. This payment would rise and fall as the selling price fluctuates.

The matter is now in the hands of the government, which has decided to refer the proposals for fuller discussion and to evolve some definite proposition, to a sub-committee in which both sides are represented.

The climate of Burma is considered a good one for rubber growing, and the proposed arrangement, if definitely adopted, should encourage people in going into the rubber planting business in the colony.

INDENTURED LABOR FOR RUBBER ESTATES.

India and Java have, for many years, been the source of labor supply for all parts of the tropical world, India furnishing labor chiefly to Ceylon and Malaya, while Java was the supplier of hands for Sumatra and other countries. This labor received "coast advances" and similar money and was indentured for three or more years.

Recently the government of the Netherlands and East Indies put a stop to the three-year indenture of Javanese coolies for Sumatra, and now it is said that the Government of British India will follow suit by deciding to abolish the system of Indian indentured labor.

Such a policy would affect the labor of the whole of the tropical world, including Jamaica, Trinidad, British and Dutch Guiana, Fiji, etc., but it would be particularly felt on Ceylon and Malayan rubber plantations where labor is of vital importance and, as before said, comes chiefly from India.

ELEPHANTS UPROOTING RUBBER TREES.

It is reported from the Middle East that several large rubber estates in the Kalutara district of Ceylon are using elephants for thinning out work. This scheme for uprooting rubber trees was first resorted to in Kalutara, it is said, by a contractor, who, having entered into a felling agreement, made a profitable business of it by this method.

PROPOSED JAPANESE CUSTOMS TARIFF REVISION.

A Government Bill recently introduced in the Japanese Diet (Parliament) proposes to modify the customs duties on various articles imported into Japan. Among these articles are seeds of rubber and gutta percha trees which are proposed for the free list. These seeds are not specified in the tariff rates now in force.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED MARCH 1, 1916.

NO. 1,155,940. Section of the metal shell portion of which is covered with rubber. H. R. Lumsden and T. H. Saxey, Jr., both of Sandusky, Ohio.

1,176,065. Tire armor. W. K. Knight, Dexter, Mo.

1,176,073. Pneumatic tire. L. McKinnon, Salt Lake City, Utah.

1,176,141. Erasing pencil. C. I. Heisler, Schenectady, N. Y.

1,176,145. Tire-carrying rim. F. Hopkinson, East Orange, N. J., assignor to United States Tire Co., New York City.

1,176,146. Instrument for administering anesthetics comprising rubber tubing. F. B. Jones, Cleveland, Ohio.

1,176,158. Pneumatic tire. J. V. Markle, assignor of one-half to C. F. East, both of Seattle, Wash.

1,176,159. Cushion tire. T. Midgley, Washington, Ohio, assignor to Morgan & Weiskel, Detroit, Mich.

1,176,161. Tire tread. A. P. Nirdlinger, Chicago, Ill.

1,176,165. Resilient tire. M. Rasmussen, Racine, Wis.

1,176,209. Joint for elastic dolls and other figures. G. R. Dice, Ashland, Ohio.

1,176,220. Automatic chair blower, comprising air hose. A. Kaczmaszky, Pigeon, Ala.

1,176,230. Tool for constructing detachable wheel rims. V. McLain, East Moline, Ill.

1,176,286. Heelless rubber overshoe. C. S. Goodyear, Naugatuck, assignor to L. Candee & Co., New Haven—both in Connecticut.

1,176,288. Rubber insulating splice cover. J. B. Hamilton, Hoboken, N. J.

1,176,295. Tread for tires. F. S. Ingoldby, Pine Lake, Mich.

1,176,305. Rubber soled boot or shoe. C. Lee, assignor to The Goodyear's Metallic Rubber Shoe Co.—both of Naugatuck, Conn.

1,176,338. Combined tire valve and pressure gage. O. F. R. Bromberg, San Diego, Calif.

1,176,434. Pneumatic tire pump. A. F. Brady, assignor of one-half to F. T. Mulford—both of San Francisco, Calif.

1,176,511. Cushioning body for tire casings. F. Zuber, Reading, Pa.

1,176,518. Self-propelling hose nozzle. J. T. Burns, New York City.

1,176,529. Self-filling fountain pen. W. I. Ferris, Westfield, N. J., assignor to L. E. Waterman Co., New York City.

1,176,552. Puncture-proof tube for pneumatic tires. A. E. Henderson, Toronto, Ontario, Canada, assignor to Superior Tubes & Accessories, Limited, a corporation of Canada.

1,176,553. Tube for pneumatic tires. A. E. Henderson, Toronto, Ontario, Canada, assignor to Superior Tubes & Accessories, Limited, a corporation of Canada.

1,176,560. Non-skidding band for tires. A. T. Hughes, Kew Green, England.

1,176,647. Shoe sole having elastic tread members. A. Bucolo, Washington, D. C.

1,176,671. Vehicle wheel for demountable tires. E. W. Fothergill, assignor to Hartford Rubber Works—both of Hartford, Conn.

1,176,674. Rubber nursing nipple. A. G. Gardiner, Providence, R. I.

ISSUED MARCH 28, 1916.

1,176,700. Resilient tire. F. G. Koehler, St. Louis, Mo.

1,176,783. Breath attachment for canisters. J. L. Sommerkamp, Glen Ridge, assignor to Consolidated Safety Pen Co., Bloomfield—both in New Jersey.

1,176,839. Support for timepieces. S. G. Lewis, Greensburg, Pa.

1,176,886. Inhaler. G. Ermoled, New York City.

1,176,907. Pressure indicator. H. P. Kraft, New York City, and M. C. Schweinert, West Hoboken, N. J.

1,176,909. Eraser and pencil holder. W. E. Lane, Kansas City, Mo.

1,176,910. Elastic bandeau. A. G. Lee, Colorado Springs, Colo.

1,177,048. Pneumatic tire. M. C. Overman, New York City.

1,177,060. Cover for dress shoes. F. Scovel, New York City.

1,177,063. Valve for pneumatic tires. B. E. Taylor, Oak Park, Ill.

1,177,099. Elastic horseshoe calf. F. J. Glanville, Morristown, N. J.

1,177,128. Hydrometer comprising a rubber bulb. M. E. Moeller, Brooklyn, N. Y.

1,177,136. Rubber boot or shoe. R. B. Price, New York City, assignor to Rubber Regenerating Co., Mishawaka, Ind.

1,177,203. Palmator. J. H. Pierpont, Pensacola, Fla.

1,177,206. Hose reel. F. Nemeo, Chicago, Ill.

1,177,263. Inflatable pneumatic rubber for vehicle sleds. J. E. Olivier, St. Gervais, France.

1,177,299. Tire valve. T. P. Borden, assignor to R. B. Low—both of New York City.

1,177,316. Hose and H. tubes, assignor to W. D. Allen Manufacturing Co.—both of Chicago, Ill.

1,177,340. Rubber vehicle tire. J. Monson, New York City.

1,177,383. Mouth connection for portable breathing apparatus. F. L. Chasen, assignor to Firm of Drägerwerk, Heintz & Bernh. Dräger—both of Lütke, Germany.

1,177,388. Massage apparatus. H. L. Crane, New York City.

1,177,412. Rubber glove. J. Hopkins, North Attleboro, Mass.

1,177,438. Splice joint comprising air tube. B. Newman, New York City.

1,177,456. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of one-half to The B. F. Goodrich Co., New York City; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio; and one-fifth to the United States Tire Co., New York City.

1,177,457. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of one-half to The B. F. Goodrich Co., New York City; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio; and one-fifth to the United States Tire Co., New York City.

1,177,458. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of one-half to The B. F. Goodrich Co., New York City; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio; and one-fifth to the United States Tire Co., New York City.

1,177,459. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of one-half to The B. F. Goodrich Co., New York City; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio; and one-fifth to the United States Tire Co., New York City.

1,177,460. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of one-half to The B. F. Goodrich Co., New York City; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio; and one-fifth to the United States Tire Co., New York City.

1,177,461. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of one-half to The B. F. Goodrich Co., New York City; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio; and one-fifth to the United States Tire Co., New York City.

1,177,462. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of one-half to The B. F. Goodrich Co., New York City; one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio; and one-fifth to the United States Tire Co., New York City.

1,177,474. Friction and metal plug for rubber heels. F. Berenstein, Chelsea—both in Massachusetts.

1,177,500. Hose patch. M. O. Dolson, Los Angeles, Calif.

1,177,549. Pneumatic tire. E. M. Stewart, Montpelier, Idaho.

1,177,582. Two wheel rubber-tired apparatus to aid blind to walking. F. Murphy, New York City.

ISSUED APRIL 4, 1916.

1,177,593. Vehicle tire. S. Ch. Beloit, Brockton, Mass.

1,177,601. Rim clamp. R. S. Bryant, assignor to The Standard Welding Co.—both of Cleveland, Ohio.

1,177,607. Inner tube for vehicle tires. J. M. Hunt, Atlanta, Ga.

1,177,630. Automatic tire alarm. A. T. Johnson, East Las Vegas, N. Mex.

1,177,636. Reel for elastic tape, etc. C. P. Kuehn, assignor to A. Stein & Co.—both of Chicago, Ill.

1,177,650. Demountable rim. G. H. Parks, Grand Rapids, Mich.

1,177,669. Tire fasteners. W. E. Wilson and S. S. Wilson—both of Des Moines, Iowa.

1,177,684. Suspender buckle and webbing combination. H. E. Crandall, New Britain, Conn.

1,177,759. Water bag and syringe. W. J. Butler, Springfield, Ill.

1,177,795. Automobile horn. C. Nagele, assignor to Lee Tire & Rubber Co.—both of Cheshock, Pa.

1,177,808. Pedal pad. G. H. Rives, New York City.

1,177,902. Method of applying rubber washers to valves of the like. M. C. Schaeffer, West Hoboken, and H. P. Kraft, Ridgebrook—both in New Jersey.

1,177,930. Tire fastener for use within the shoe of a pneumatic tire. H. J. Coers, West New York, N. J.

1,177,979. Section holding means for dental plates. F. W. Wilson, Willets, Calif.

1,178,008. Spring wheel with solid rubber tire. M. E. Hanson and J. B. Kuehn—both of Van Nuys, Va.

1,178,074. Tire tread. W. J. Howard, Seattle, Wash.

1,178,145. Pipe testing plug having an open annular rubber gasket. J. Florence and C. Frauer—both of Indianapolis, Ind.

1,178,202. Demountable cushion tire. W. H. Allen, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.

1,178,327. Resilient vehicle wheel comprising two outer rims having interposed rubber blocks. G. H. McKinnis and L. E. Neale—both of Washburn, Idaho.

1,178,361. Ornamented rubber ball. C. Van Selver, assignor to Lambertville Rubber Co.—both of Lambertville, N. J.

1,178,414. Fountain pen. H. Sawamura, New York City.

1,178,421. Combined air mattress and life preserver. C. T. Smith, Mableton, Wash.

1,178,481. Tire repairing clamp. A. M. Roland, assignor to A. Newhouse—both of San Francisco, Calif.

ISSUED APRIL 11, 1916.

1,178,484. Hose. G. R. Ansell, assignor to Dunlop Tire & Rubber Goods Co.—both of Toronto, Canada.

1,178,517. Jar closure comprising an inelastic rubber ring. H. Hartmann, assignor to Firm Globus, Gummi & Asbestwerke G. M. B. H.—both of Ahrensberg, Germany.

1,178,541. Vehicle wheel rim. E. C. Shaw, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.

1,178,589. Flexible gas tubing. J. J. Vautier, New York City.

1,178,741. Piston packing strip formed of alternate parallel layers of fabric and rubber. C. L. E. Mastin, Midland Park, N. J.

1,178,754. Sectional wheel rim. R. R. Royal, San Francisco, Calif.

- 1,178,806. Tire valve. H. P. Knatt, New York City, and M. C. Schweinert, West Hoboken, N. J., assignors to A. Schrader's Son, Inc., New York City.
- 1,178,821. Elastic belt. M. Scheuer, assignor to American Belt Corporation—both of New York City.
- 1,178,833. Shaving brush embodying a disc of rubber sponge and an embracing elastic band. F. W. Bacon, Sewickley, Pa.
- 1,178,839. Hose coupling. R. Carlson, Greenwich, Conn.
- 1,178,869. Overlay for half-tone printing having a cushioning surface of rubber. J. B. Neale, assignor of one-half to F. W. Gage—both of Battle Creek, Mich.
- 1,178,870. Half-tone overlay formed of rubber. J. B. Neale, assignor of one-half to F. W. Gage—both of Battle Creek, Mich.
- 1,178,874. Life preserver including a bag of flexible waterproof material. N. K. Ramos, Lansing, Mich.
- 1,178,944. Rubber typewriter eraser. N. Ransom, Jersey City, N. J.
- 1,178,968. Resilient tire. J. M. Taylor, Ohio, Va.
- 1,179,018. Life-saving appliance. H. McFarlane and N. E. Rogers, assignors to Boddy Lifesaving Appliances, Limited—both of London, Eng.
- 1,179,086. Fountain pen. J. O. Foster, Seattle, Wash.
- 1,179,123. Vehicle wheel. S. R. McKay, East Cleveland, Ohio.
- 1,179,159. Rubber banding in knickerbockers for women, etc. O. E. Buley, London, Eng.
- 1,179,172. Life-saving appliance. G. M. Boddy, assignor to Boddy Life-saving Appliances, Limited—both of London, Eng.

Residue.

- 14,110. Life preserver. O. A. Youngren, assignor to National Life Preserver Co.—both of Sheridan, Wyo.

THE DOMINION OF CANADA.

ISSUED JANUARY 31, 1916.

- 167,006. Sleeping bag having incorporated therein a waterproof sheet. W. H. Simpson, Montreal, Quebec, Canada.
- 167,033. Garter. The I. B. Kleintner Rubber Co., assignee of R. K. Guinzberg—both of New York City.
- 167,066. Hose nozzle. A. E. Elbertsen, Stamford, Conn.
- 167,295. Rim for vehicle tires. G. F. Rafter, Covington, Kentucky.
- 167,302. Waterproof cover for automobiles and collapsible water part. F. B. Sullivan, Carson City, Nevada.

THE UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent upon the filing of the application.

Desiderata Patents for American Inventions.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MARCH 15, 1916.]

- 23,498 (1914). Nail polisher comprising an inflatable bladder. J. H. Leavin, 20 Rue Cambon, Paris.
- 23,569 (1914). India rubber pads in a machine for forming hat covers. F. A. Dunkerley, 198 Marlborough street, Rye, Kent, Ash-ton-under-Lyne.
- 23,638 (1914). Sheet rubber linings for neck-ties. W. Hey, 6 Grimstone Terrace, Hull Road, York.
- 23,667 (1914). Corset mainly of elastic webbing. A. Soum, 138 Brompton Road, London.
- 23,734 (1914). Flooring for ships' decks, in which rubber filling is used between sections. Wailes, Dove & Co., 5 St. Nicholas Buildings, St. Nicholas street, Newcastle-on-Tyne, and C. MacDonald, 71 Julian avenue, South Shields.
- 23,774 (1914). Rubber covered canvas receiving screen for cinematograph projection. British Patent Subbrite Co., and E. G. Meadway—both of 31 Lombard street, London.
- 23,781 (1914). Rubber rims for lamp shades. F. A. Andrews and T. G. Allen—both of 106 Victoria street, Westminster.
- 100,026 (1916). Rubber tube for pharmaceutical preparations. M. de Jong, 16 J. D. M. Amsterdam.
- 100,038 (1916). Rubber in the manufacture of artificial leather. N. G. Scheuer, 6 Gyldenlovesgade, Copenhagen.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MARCH 22, 1916.]

- 23,829 (1914). Cushion tire. T. Thibault, 4 Rue du Commandant Riviere, Paris.
- 23,850 (1914). Waterproof sleeping bag. H. M. Knight, 9 Lilliput Lane, London.
- 23,855 (1914). Toy boats, etc., propelled by twisted rubber bands. G. Thomas, 46 Gutter Grove, Chelsea, London.
- 23,890 (1914). Toy gun with rubber disc projectiles. G. W. Kingsland, Tunnel Hill, Worcester.
- 23,938 (1914). Billiard table cushion. W. J. Mellersh-Jackson, 38 Southampton Buildings, London.
- *23,975 (1914). Gramophone sound box formed of hard and soft rubber parts. A. D. Jones, 46 Sibley Building, 1214 Filbert street, Philadelphia, Pa.
- 23,065 (1914). Rubber soles with reinforcing plate of sheet metal. F. W. Poulsen, 115a Trafalgar Road, Greenwich, London.
- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MARCH 29, 1916.]
- 23,077 (1914). Rubber ring in apparatus for delivering measured quantities of liquid. R. Parker & Sons, and M. Powley, 3 Handel street, Sunderland.
- 23,132 (1914). Flexible breathing bag. R. H. Davis, 187 Westminster Bridge Road, London.

- 23,170 (1914). Surgical probe having rubber encased conductor tubes. D. Endless, 74 Woodside, Wimbledon, London.
- 23,177 (1914). Spring wheel with continuous outer rigid ring and pneumatic cushioning. W. Morgan, Hafod Arael, Aberllynny, Monmouthshire.
- 23,241 (1914). Tire protector for insertion between the air tube and cover. A. Dow, 1733 Broadway, New York City.
- 23,283 (1914). Telephone receiver with vulcanite cap. L. Brown and C. Macintosh & Co., Cambridge street, Manchester.
- 23,309 (1914). Non-skid device for wheel tire. W. Cross, 10 New Court, Lincoln's Inn, London. (J. R. Peck, Boston, Massachusetts).
- *23,310 (1914). Elastic self-adjusting waistband for women's garments. A. Malsin, 25 West 38th street, New York City.
- 23,313 (1914). Sheet armor for body wear, or for protection of aeroplanes, ships and cars of dirigible balloons enclosed in cotton and india rubber cloth. N. Lacrotte, 136 Avenue Farmerie, Paris.
- 23,320 (1914). Rubberized leather protectors for pneumatic tires. A. M. Kobielle, 18 Garden avenue, Kew, near Melbourne, Australia.
- 23,326 (1914). An attachment for watering cans, hose pipes, etc., comprising a rubber ring. T. H. Webster, Stock, Ingateson, Essex.
- 23,356 (1914). Wheel tire. A. Rosa, 46 Corso Casale, Turin, Italy.
- 23,358 (1914). Wheel tire. A. Rosa, 46 Corso Casale, Turin, Italy.
- 23,439 (1914). Marine life-saving apparatus, inflatable and buoyant. J. Davis, The Cottage, Turpin, Bradford-on-Avon, Wiltshire.
- 23,462 (1914). Toy operated by elastic cords. T. Crawford, Wilton House, Stapleton Place, Dundalk, Ireland.
- 23,439 (1914). Metal and rubber disc bottle closures. H. Birbeck, 329 High Holborn, London. (L. M. Rosenthal, 1105 Park avenue, Mount Vernon, New York).
- 23,510 (1914). Tread band comprising solid square headed studs secured by riveting to a rubber and canvas band. H. Agha, Eagle Lodge, Hale, Cheshire.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, APRIL 5, 1916.]

- 23,545 (1914). TIMES pad, comprising an india rubber envelope. H. C. Stephens, Chiddingfold, Wiltshire.
- 23,550 (1914). Mine-ventilating device employing a rubber block. J. J. C. Albion, Linton, Rutlandshire, and J. Walker, Woodlands Colliery—both in Durham.
- *23,562 (1914). Rubber rings in tape cutting and winding machine. C. H. Thorndarson, 501 South Jefferson street, Chicago, Ill.
- 23,585 (1914). Rubber buffers in machine for polishing or scouring needles, etc. C. E. Baylis, 34 Millboro' Road, Redditch, Worcestershire.
- 23,610 (1914). Reinforced rubber sole pads for boots and shoes. W. W. Phillips, 142 Old street, London.
- 23,737 (1914). Non-skid device for twin tires. F. H. Shepper, 7 Thomas street, and S. G. Juwitt, 104 Lawrence street—both in York.
- 23,779 (1914). Corned leg rests and walking sticks with rubber and caps. G. E. Marshall, 28 Chilworth street, Paddington, London.
- 23,870 (1914). Inhaler, preferably made of india rubber or gutta percha. A. D. Nicker, 6 Wei Hai Wei Road, Shanghai, China.
- 23,895 (1914). Protector for breech action and magazine of a rifle of waterproof fabric. W. C. Hammond, St. Augustine, East Molesey, Surrey.

NEW ZEALAND.

ISSUED FEBRUARY 17, 1916.

- 36,987. Milking machine test cup. N. J. Daysh, Carterton, New Zealand.
- 36,989. Tire tube valve connection. A. E. Henderson, Kent Building, Toronto, Canada.
- 37,084. Hose nozzle and the like attachment. C. Dobbie, 4 Warwick street, Hobart, Tas.

ISSUED MARCH 2, 1916.

- 36,790. Brush and brush manufacture. The Rubber Set Brush Co., Limited, 21 Bucklersbury, London, England.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

- 478,238 (April 1, 1915). Plugs for stopping perforations in pneumatic tires. B. W. Spittler.
- 478,294 (April 6). Splash guard for automobile wheels and others. E. D. Self.
- 478,295 (April 6). Tire with a mud guard. E. D. Self.
- 478,303 (April 7). Improved pneumatic tire pump. J. Heeley.
- 478,416 (April 16). Pneumatic tire. The American Tire Co.
- 478,424 (April 17). Improved reinforced armor for pneumatic tires. M. Patrick.
- 478,454 (April 20). Improved valves for pneumatic tire inner tubes. C. E. Baker.
- 478,470 (April 22). Elastic wheel. E. Basjanoff.

THE GERMAN EMPIRE.

PATENT ISSUED (With Date of Validity).

- 641,270. Elastic solid tire for vehicle wheels. National Antriebs, G. m. b. H.

Official India Rubber Statistics for the United States,

Fiscal Year Ended June 30, 1915.

INDIA RUBBER.

IMPORTS OF CRUDE INDIA RUBBER (FREE).

FROM	POUNDS.	VALUE.
<i>Europe:</i>		
Belgium.....	1,502,370	\$950,872
France.....	685,699	284,862
Germany.....	739,105	358,931
Netherlands.....	313,407	161,543
Portugal.....	413,624	1,374,526
Spain.....	20,463	10,510
United Kingdom—England.....	75,168,236	39,168,519
Totals, Europe.....	82,960,904	\$42,329,763

<i>North America:</i>		
British Honduras.....	3,088	\$1,100
Canada.....	4,973,436	2,788,824
Central American States.....	1,061	
Costa Rica.....	60,187	29,681
Guatemala.....	32,569	16,001
Honduras.....	2,907	
Nicaragua.....	378,349	188,109
Panama.....	267,148	102,602
Salvador.....	20,420	10,345
Mexico.....	1,827,912	706,350
Totals, North America.....	7,591,716	\$1,064,340

<i>South America:</i>		
Brazil.....	48,753,670	\$20,738,776
Chile.....	148,343	75,239
Colombia.....	42,005	182,458
Ecuador.....	366,139	136,903
Guatemala.....	1,800	
Peru.....	1,154,110	1,334,363
Uruguay.....	142,103	75,529
Venezuela.....	469,790	205,257
Totals, South America.....	53,462,606	\$22,747,566

<i>Asia:</i>		
British East Indies—		
British India.....	87,804	\$34,689
Straits Settlements.....	13,225,775	6,645,079
Other British.....	10,549,113	2,549,183
Dutch East Indies.....	4,035,991	2,144,477
Japan.....	5,059	2,601
Russia in Asia.....	38,054	2,448
Totals, Asia.....	27,941,796	\$14,054,307

<i>Oceania:</i>		
Philippine Islands.....	3,818	\$1,738
<i>Africa:</i>		
Belgian Congo.....	102,750	\$41,265
British South Africa.....	1,190	337
Portuguese Africa.....	5,194	1,083
Totals, Africa.....	109,134	\$42,655

Totals, 1914-15.....	172,068,428	\$83,030,269
Totals, 1913-14.....	151,995,742	71,219,851
Totals, 1912-13.....	113,384,359	90,170,316
Totals, 1911-12.....	110,210,173	93,013,253
Totals, 1910-11.....	72,046,260	76,244,603
Totals, 1909-10.....	101,044,681	101,078,825
Totals, 1908-09.....	88,459,895	61,709,723
Totals, 1907-08.....	6,233,160	36,013,185
Totals, 1906-07.....	76,963,838	58,919,981
Totals, 1905-06.....	57,244,345	45,114,450

IMPORTS OF MANUFACTURES OF INDIA RUBBER (DUTIABLE).

[+ indicates increase; — indicates decrease, compared with the preceding year.]

FROM	POUNDS.	VALUE.
<i>Europe:</i>		
Austria-Hungary.....	\$42,224	
Belgium.....	30,361	
Denmark.....	224	
France.....	49,795	
Germany.....	264,771	
Italy.....	6,549	
Netherlands.....	1,161+	
Norway.....	179+	
Russia in Europe.....	23,375	
Sweden.....	34	
Switzerland.....	34	
United Kingdom—		
England.....	17,711—	
Scotland.....	14,705—	
Ireland.....	119	
Totals, Europe.....	\$708,784	

North America:

Canada.....	\$80,429+	
Mexico.....	436+	
Newfoundland and Labrador.....	120	
Totals, North America.....	\$80,985	

South America:

Argentina.....	\$7	
Asia.....		
Japan.....	\$1,023—	
Turkey in Asia.....	395+	
Totals, Asia.....	\$1,418	

Oceania:

Australia.....	\$290	
New Zealand.....	58	
Totals, Oceania.....	\$8	

Totals, 1914-15.....	\$791,281	
Totals, 1913-14.....	1,517,789	
Totals, 1912-13.....	1,217,336	
Totals, 1911-12.....	874,736	
Totals, 1910-11.....	875,125	
Totals, 1909-10.....	1,154,347	
Totals, 1908-09.....	1,391,770	
Totals, 1907-08.....	1,956,590	
Totals, 1906-07.....	2,562,783	
Totals, 1905-06.....	1,992,413	

RE-EXPORTS OF IMPORTED CRUDE INDIA RUBBER.

TO—	POUNDS.	VALUE.
Belgium.....	5,310	\$1,935
Denmark.....	310,724	178,696
Finland.....	1,092	1,681
France.....	304,010	138,977
Germany.....	36,346	13,361
Italy.....	604,315	366,132
Netherlands.....	4,474	6,460
Norway.....	196,175	106,505
Russia in Europe.....	218,834	145,956
Sweden.....	21,564	120,928
United Kingdom—		
England.....	234,904	114,548
Scotland.....	550	209
Canada.....	3,092,590	1,623,819
Dutch West Indies.....	50	44
Straits Settlements.....	450	220
Japan.....	27,137	17,687
Russia in Asia.....	1,107,496	5,507,768
Oceania—Australia.....	5,474	3,400
Totals, 1914-15.....	6,383,145	\$3,361,107
Totals, 1913-14.....	3,747,749	2,198,150
Totals, 1912-13.....	5,272,387	4,476,379
Totals, 1911-12.....	5,610,951	4,800,905
Totals, 1910-11.....	5,267,588	5,439,282
Totals, 1909-10.....	6,492,947	7,629,390
Totals, 1908-09.....	3,791,971	2,964,496
Totals, 1907-08.....	4,101,667	2,994,208
Totals, 1906-07.....	4,215,350	3,593,912

RE-EXPORTS OF MANUFACTURES OF INDIA RUBBER.

TO—	POUNDS.	VALUE.
France.....	\$140	
Germany.....	87	
United Kingdom—		
England.....	392	
Scotland.....	1,993	
Canada.....	3,203	
Central American States—Panama.....	6	
Mexico.....	22	
Newfoundland and Labrador.....	69	
West Indies—Cuba.....	36,401	
Oceania—Australia.....	1,952	
Totals, 1914-15.....	\$7,489	
Totals, 1913-14.....	7,638	
Totals, 1912-13.....	7,973	
Totals, 1911-12.....	6,681	
Totals, 1910-11.....	29,456	
Totals, 1909-10.....	13,868	
Totals, 1908-09.....	16,407	
Totals, 1907-08.....	176,739	
Totals, 1906-07.....	32,712	

GUTTA PERCHA.

IMPORTS OF CRUDE GUTTA PERCHA (FREE).

FROM	POUNDS.	VALUE.
<i>Europe:</i>		
France.....	35,482	\$10,569
Germany.....	42,118	28,901
United Kingdom—		
England.....	46,318	10,395
Scotland.....	11,740	1,190
Totals, Europe.....	135,558	\$51,055

<i>North America:</i>		
Canada.....	408	\$90

<i>Asia:</i>		
British East Indies—		
Straits Settlements.....	1,334,124	\$171,355
Dutch East Indies.....	435,800	7,885
Totals, Asia.....	1,479,924	\$179,240

<i>Oceania:</i>		
Philippine Islands.....	2,324	\$365

Totals, 1914-15.....	1,618,214	\$230,750
Totals, 1913-14.....	1,846,109	323,567
Totals, 1912-13.....	480,853	167,313
Totals, 1911-12.....	1,204,406	225,797
Totals, 1910-11.....	1,648,921	390,548
Totals, 1909-10.....	784,501	167,873
Totals, 1908-09.....	518,999	167,136
Totals, 1907-08.....	189,610	100,305
Totals, 1906-07.....	346,890	201,339
Totals, 1905-06.....	500,770	188,611
Totals, 1904-05.....	965,217	210,188
Totals, 1903-04.....	424,617	174,953
Totals, 1902-03.....	316,290	222,400
Totals, 1901-02.....	535,767	252,329
Totals, 1900-01.....	280,560	130,957
Totals, 1899-00.....	427,678	178,616
Totals, 1898-99.....	364,854	167,577
Totals, 1897-98.....	636,477	159,381
Totals, 1896-97.....	1,117,665	100,187
Totals, 1895-96.....	1,343,854	178,513
Totals, 1894-95.....	1,326,794	122,261
Totals, 1893-94.....	498,763	84,340
Totals, 1892-93.....	582,378	116,808
Totals, 1891-92.....	308,239	114,874
Totals, 1890-91.....	960,835	164,524

IMPORTS OF MANUFACTURES OF GUTTA PERCHA (DUTIABLE).

FROM	POUNDS.	VALUE.
<i>Europe:</i>		
France.....		\$511
Germany.....		7,069
Great Britain—		
England.....		3,006
Scotland.....		214
Totals, Europe.....		\$10,800

<i>North America:</i>		
Canada.....		\$40

<i>West Indies—Other British.....</i>		1
Totals, North America.....		\$41

Totals, 1914-15.....	\$10,841	
Totals, 1913-14.....	42,023	
Totals, 1912-13.....	77,300	
Totals, 1911-12.....	41,098	
Totals, 1910-11.....	61,283	
Totals, 1909-10.....	80,567	
Totals, 1908-09.....	71,819	
Totals, 1907-08.....	93,545	

RE-EXPORTS OF CRUDE GUTTA PERCHA.

TO—	POUNDS.	VALUE.
United Kingdom—England.....	5,997	\$3,115
Canada.....	3,460	1,488
Totals, 1914-15.....	9,457	\$4,603
Totals, 1913-14.....	14,649	5,255
Totals, 1912-13.....	23,335	6,665
Totals, 1911-12.....	1,011	945
Totals, 1910-11.....	62,391	19,235
Totals, 1909-10.....	74,137	13,886
Totals, 1908-09.....	9,370	3,730
Totals, 1907-08.....		
Totals, 1906-07.....	5,000	700

GUAYULE GUM.

IMPORTS OF GUAYULE (FREE).		
FROM—	POUNDS.	VALUE.
Mexico	5,111,849	\$1,441,367
Totals, 1914-15.....	5,111,849	\$1,441,367
Totals, 1913-14.....	4,755,804	607,076
Totals, 1912-13.....	10,218,191	4,345,088
Totals, 1911-12.....	14,386,025	6,463,787
Totals, 1910-11.....	19,749,822	10,443,157

RE-EXPORTS OF GUAYULE GUM.

TO—	POUNDS.	VALUE.
Canada	29,891	\$8,901
Totals, 1914-15.....	29,891	\$8,901
Totals, 1913-14.....	56,399	22,378
Totals, 1912-13.....	83,769	54,669
Totals, 1911-12.....	197,948	98,517
Totals, 1910-11.....	340,405	175,995
(Not reported until 1910-11.)		

GUTTA JELUTONG.

IMPORTS OF GUTTA JELUTONG (PONTIANAK) (FREE).		
FROM—	POUNDS.	VALUE.
Europe		
Germany	9,191	\$9,991
England	66,080	\$5,993
Totals, Europe.....	75,271	\$6,984

Asia		
British East Indies—		
Straits Settlements	14,466,728	\$708,706
Dutch East Indies.....	311,715	16,305
Totals, Asia.....	14,778,593	\$725,011

Totals, 1914-15.....	14,851,264	\$731,995
Totals, 1913-14.....	24,226,521	1,155,402
Totals, 1912-13.....	45,345,338	2,174,441
Totals, 1911-12.....	48,795,268	2,255,050
Totals, 1910-11.....	51,429,872	2,872,633
Totals, 1909-10.....	52,392,444	2,419,223
Totals, 1908-09.....	24,826,296	852,372
Totals, 1907-08.....	22,803,303	1,039,276
Totals, 1906-07.....	28,437,660	1,085,098
Totals, 1905-06.....	21,390,116	733,074
Totals, 1904-03.....	64,131,911	2,413,519
Totals, 1903-04.....	14,887,416	430,231
Totals, 1902-03.....	13,984,817	345,431
Totals, 1901-02.....	16,850,821	501,418
Totals, 1900-01.....	9,471,087	248,838
Totals, 1899-00.....	8,701,753	237,214
Totals, 1898-99.....	6,473,882	166,419

RE-EXPORTS OF GUTTA JELUTONG (PONTIANAK).

TO—	POUNDS.	VALUE.
Totals, 1914-15.....	32,000	\$2,000
Totals, 1913-14.....	3,000	163
Totals, 1912-13.....	118,486	6,079
Totals, 1911-12.....	2,139	112
Totals, 1909-10.....	2,139	112

BALATA.

IMPORTS OF BALATA (FREE).

FROM—	POUNDS.	VALUE.
Europe		
France	4,272	\$1,922
England	33,308	17,545
Totals, Europe.....	37,580	\$19,467
North America		
Cent. Amer. Sts.—Panama	577,128	\$170,313
British West Indies—		
Barbados	1,949	1,200
Trinidad	96,739	36,924
Dutch West Indies.....	19,000	10,070
Totals, North America	694,816	\$218,507
South America:		
Colombia	2,160	\$626
Guiana—		
British	357,943	168,874
Dutch	443,080	255,731
French	44,089	19,625
Venezuela	84,536	280,224
Totals, South America	1,739,828	\$725,410
Totals, 1914-15.....	2,472,224	\$963,384
Totals, 1913-14.....	1,533,024	793,126
Totals, 1912-13.....	2,318,598	1,166,772
Totals, 1911-12.....	1,517,066	984,012
Totals, 1910-11.....	878,305	634,702
Totals, 1909-10.....	196,878	106,878
Totals, 1908-09.....	1,157,018	522,872
Totals, 1907-08.....	584,582	276,756
Totals, 1906-07.....	799,029	395,044
Totals, 1905-06.....	374,220	152,689

RE-EXPORTS OF BALATA.

TO—	POUNDS.	VALUE.
Sweden	23,573	\$10,609
United Kingdom—		
England	980,250	386,407
Scotland	69,544	28,319
Central American States—		
Panama	1,850	600
Colombia	5,402	600
Totals, 1914-15.....	1,076,619	\$426,725
Totals, 1913-14.....	223,983	127,139
Totals, 1912-13.....	118,334	77,963
Totals, 1911-12.....	62,539	38,423
Totals, 1910-11.....	260,115	187,741
Totals, 1909-10.....	42,750	23,907
Totals, 1908-09.....	233,907	187,471
Totals, 1907-08.....	18,741	12,659
Totals, 1906-07.....	12,659	

SCRAP RUBBER.

IMPORTS OF SCRAP AND REFUSE RUBBER (FREE).

FROM—	POUNDS.	VALUE.
Europe		
Austria-Hungary	5,240	\$154
Belgium	76,471	3,106
France	44,800	3,200
Denmark	3,400	200
Germany	728,104	\$1,611
Italy	319,921	15,108
Spain	31,425	1,845
Netherlands	75,886	4,295
Norway	21,508	1,472
Russia	593,443	28,377
Sweden	6,980	431
Switzerland	357,024	19,234
Turkey	21,190	1,494
Turkey, Europe	143,943	9,343
United Kingdom—England	3,820,491	242,926
Totals, Europe.....	6,198,846	\$431,745

North America:		
British Honduras	1,600	\$217
Canada	4,286,195	265,491
Central American States—		
Costa Rica	3,559	303
Panama	17,518	900
Mexico	65,227	5,639
Newfoundland and Labrador	36,506	2,385
British West Indies		
Barbados	3,000	125
Jamaica	2,526	294
Other British	204	10
Cuba	190,966	9,056
Totals, North America	4,609,591	\$284,440

South America:		
Brazil	5,926	\$108
Colombia	1,841	150
Venezuela	3,434	210
Totals, South America	11,201	\$468

Asia:		
China	36,110	\$2,729
British India	37,488	2,999
Dutch East Indies	2,622	96
Hongkong	22,400	894
Japan	5,150	139
Russia in Asia	13,276	839
Totals, Asia.....	117,496	\$7,696

Europe		
Australia	36,345	\$1,468
New Zealand	33,449	1,097
Totals, Europe.....	66,794	\$2,565

Totals, 1914-15.....	11,006,928	\$726,915
Totals, 1913-14.....	25,938,111	1,096,198
Totals, 1912-13.....	43,385,456	3,709,238
Totals, 1911-12.....	26,293,192	2,095,605
Totals, 1910-11.....	15,748,002	1,164,785
Totals, 1909-10.....	37,364,671	2,998,697
Totals, 1908-09.....	20,497,695	1,543,267
Totals, 1907-08.....	16,431,035	1,066,887
Totals, 1906-07.....	29,335,193	2,608,987
Totals, 1905-06.....	24,756,486	1,721,678
Totals, 1904-05.....	15,755,214	953,439
Totals, 1903-04.....	20,770,970	1,164,785
Totals, 1902-03.....	24,659,394	1,516,137
Totals, 1901-02.....	22,894,900	1,437,690
Totals, 1900-01.....	19,093,547	1,249,231
Totals, 1899-00.....	10,513,604	462,044
Totals, 1898-99.....	9,488,327	408,877
Totals, 1897-98.....	3,653,949	113,722
Totals, 1896-95.....	3,874,677	123,068
Totals, 1894-93.....	189,894	6,128
Totals, 1893-92.....	1,774,008	55,803
Totals, 1892-91.....	10,543	25,631
Totals, 1891-92.....	1,841,786	66,775

EXPORTS OF SCRAP AND REFUSE RUBBER.

TO—	POUNDS.	VALUE.
Europe:		
Austria-Hungary	2,616	\$441
Belgium	305,200	19,000
France	138,714	18,902

Germany	38,775	9,163
Italy	38,874	3,797
Netherlands	13,426	2,033
Sweden	78,521	13,898
United Kingdom—		
England	1,025,793	136,704
Scotland	450,645	51,129
Totals, Europe.....		\$236,267

North America:		
Canada	603,564	\$53,805
Totals, North America.....		\$139,449

Totals, 1914-15.....	2,422,091	\$201,421
Totals, 1913-14.....	6,207,672	598,287
Totals, 1912-13.....	2,269,465	880,442
Totals, 1911-12.....	7,336,584	780,188
Totals, 1910-11.....	7,049,729	743,604
Totals, 1909-10.....	6,143,610	578,944
Totals, 1908-09.....	4,071,795	402,897
Totals, 1907-08.....	4,255,789	449,727
Totals, 1906-07.....	4,756,621	548,695
Totals, 1905-06.....	a	339,507
Totals, 1904-05.....	a	304,945

(a) Not officially reported.

RE-EXPORTS OF SCRAP RUBBER.

TO—	POUNDS.	VALUE.
United Kingdom—England	3,483	\$373
Totals, 1914-15.....	3,483	\$373
Totals, 1913-14.....	24,295	2,450
Totals, 1912-13.....	87,830	11,223
Totals, 1911-12.....	302,105	28,136
Totals, 1910-11.....	401,231	43,338
Totals, 1909-10.....	61,393	5,573
Totals, 1908-09.....	28,506	2,093
Totals, 1907-08.....	21,713	2,943
Totals, 1906-07.....	105,463	9,444

RECLAIMED RUBBER.

EXPORTS OF RECLAIMED RUBBER.

TO—	POUNDS.	VALUE.
Europe:		
Belgium	6,685	\$1,300
France	295,319	30,727
Germany	10,608	1,436
Italy	21,243	2,446
Norway	2,779	357
Sweden	4,571	694
United Kingdom—		
England	886,072	134,300
Scotland	90,807	13,550
Totals, Europe.....	1,340,384	\$195,019

North America:		
Canada	4,511,317	\$610,467
Panama	10	2
Totals, North America	4,511,327	\$610,469

South America:		
Brazil	1,507	\$291

Asia:		
Japan	116,657	\$16,731

Oceania:		
Philippine Islands.....	505	\$51

Totals, 1914-15.....	5,970,380	\$822,561
Totals, 1913-14.....	5,583,860	834,440
Totals, 1912-13.....	2,413,247	937,004
Totals, 1911-12.....	5,397,806	875,501
Totals, 1910-11.....	4,994,527	781,650
Totals, 1909-10.....	4,994,527	781,650
Totals, 1908-09.....	3,196,551	414,861
Totals, 1907-08.....	2,947,974	418,738
Totals, 1906-07.....	4,542,988	637,985
Totals, 1905-06.....	4,084,696	511,843
Totals, 1904-05.....	a	522,902

(a) Not officially reported.

SUBSTITUTES, ELASTICON, ETC.

IMPORTS OF ELASTICON AND SIMILAR SUBSTITUTES FOR INDIA RUBBER (DUTABLE).

FROM—	POUNDS.	VALUE.
Europe:		
England		\$18,170
France		1,260
Germany		919
Totals, Europe.....		\$30,349

Totals, 1914-15.....		\$30,349
Totals, 1913-14.....		87,642
Totals, 1912-13.....		97,452
Totals, 1911-12.....		97,328
Totals, 1910-11.....		115,601
Totals, 1909-10.....		114,516
Totals, 1908-09.....		53,625
Totals, 1907-08.....		27,000

RE-EXPORTS SUBSTITUTES, ELASTICON, ETC.

TO—	POUNDS.	VALUE.
United Kingdom—England		\$345
Mexico		19
Totals, 1914-15.....		\$364

EXPORTS OF AMERICAN RUBBER GOODS, FISCAL YEAR ENDED JUNE 30, 1915.

EXPORTED TO	Belting, Hose and Packings	Boots		Shoes		Tires			Total value,
	Value.	Pairs.	Value.	Pairs.	Value.	Auto motor value.	Other value.	Other goods value.	
Austria-Hungary	520	.....	.....	.....	\$558	.....	.....	\$175	\$733
Brazil and Madeira Islands	73	.....	.....	.....	888	\$178	\$566	849	1,563
Belgium	73	.....	.....	10,524	5,788	.....	.....	2,419	8,280
Bulgaria	.....	.....	.....	.....	.....	.....	.....	.....	150
Denmark	2,110	.....	.....	60,867	26,132	12,288	2,988	24,530	72,948
Finland	1,743	.....	.....	.....	.....	.....	.....	270	2,113
France	6,500	24,187	\$40,204	761,402	1,254,228	8,723	359	87,811	1,998,225
Germany	.....	.....	.....	.....	5,356	.....	.....	.....	48,553
Gibraltar	.....	.....	.....	1,395	916	.....	.....	.....	916
Greece	.....	880	1,495	.....	.....	2,680	1,525	1,577	2,405
Italy	5,846	54	749	41,637	24,247	11,740	31,293	30,806	104,681
Netherlands	1,342	.....	.....	12,077	5,661	1,407	102	14,290	23,302
Norway	3,349	.....	.....	54,686	28,985	7,464	.....	4,475	46,865
Portugal	1,094	.....	.....	.....	48	1,434	1,013	1,111	4,692
Russia in Europe	945	.....	.....	.....	.....	6,480	.....	5,191	12,616
Serbia, Montenegro, etc.	100	.....	.....	.....	.....	.....	.....	.....	208
Spain	1,281	.....	.....	\$1,951	26,797	2,408	.....	3,835	37,014
Sweden	1,319	.....	.....	1,115	525	6,697	14,939	8,915	52,405
Switzerland	.....	4	9	17,126	8,607	.....	.....	2,079	10,746
Turkey in Europe	.....	.....	.....	13,750	6,970	1,927	.....	13	8,910
United Kingdom	.....	.....	.....	.....	.....	.....	.....	.....	.....
England	271,708	231,688	518,643	63,039	360,310	2,655,099	190,597	1,550,567	5,546,924
Scotland	7,154	.....	268	31,218	12,458	245	.....	42,511	63,036
Ireland	127	.....	.....	1,702	779	.....	.....	254	1,160
Totals, Europe	\$311,434	257,219	\$561,368	1,727,781	\$1,769,297	\$2,745,456	\$247,537	\$1,818,139	\$7,453,245
NORTH AMERICA									
Bermuda	\$611	5	\$11	623	\$394	\$129	\$342	\$2,569	\$4,066
British Honduras	733	.....	.....	39	40	64	89	2,665	3,591
Canada	247,114	22,928	66,237	32,252	27,011	772,574	13,888	787,570	1,914,794
Central American States	.....	.....	.....	.....	.....	.....	.....	.....	.....
Costa Rica	5,143	.....	.....	30	16	2,381	1,759	4,815	14,114
Guatemala	8,832	5	159	80	80	2,406	959	3,279	16,561
Honduras	8,828	.....	.....	92	47	3,229	365	4,550	15,019
Nicaragua	3,296	36	90	18	385	419	688	5,110	9,988
Panama	27,982	1	9	7,178	6,487	24,549	15,467	29,706	114,196
Salvador	5,931	.....	.....	.....	.....	2,617	73	16,653	25,274
Mexico	168,436	33	148	87	53	106,083	19,935	501,28	344,673
St. John, Langley, etc.	1,019	.....	2,649	.....	706	.....	.....	8	5,538
Newfoundland and Labrador	8,002	14,375	33,265	70,843	35,514	4,034	855	6,870	88,540
West Indies—British—	.....	.....	.....	.....	.....	.....	.....	.....	.....
Barbados	265	.....	.....	.....	.....	4,136	7	885	5,303
Jamaica	5,915	7	18	60	36	36,887	12,570	6,229	61,655
Trinidad and Tobago	6,887	.....	.....	2,994	2,598	22,627	1,578	4,580	36,415
Other British	4,230	.....	.....	48	33	3,327	1,265	2,196	9,064
Cuba	109,425	642	1,581	2,843	1,536	192,355	70,832	178,459	554,188
Danish	265	12	33	36	33	577	548	454	1,910
Dutch	190	.....	.....	95	61	3,068	184	851	4,173
French	318	.....	.....	6	8	1,527	573	2,022	4,448
Haiti	724	24	61	19	11	526	117	728	4,417
Santo Domingo	8,590	1	3	330	224	3,062	4,082	5,827	21,818
Totals, North America	\$627,696	39,087	\$104,100	119,377	\$75,357	\$1,187,632	\$146,186	\$1,116,894	\$3,257,865
SOUTH AMERICA									
Argentina	\$28,215	246	\$779	21,878	\$10,580	\$34,066	\$7,439	\$75,869	.....
Bolivia	805	.....	.....	.....	.....	3,413	205	143	.....
Brazil	23,714	133	335	4,096	4,677	27,425	8,833	67,567	.....
Chile	107,006	1,276	4,172	4,387	3,144	21,353	17,250	27,653	.....
Colombia	8,593	12	53	776	336	15,236	4,567	9,423	.....
Ecuador	3,914	.....	.....	696	272	8,620	367	7,387	.....
Guiana	.....	.....	.....	.....	.....	.....	.....	.....	.....
British	1,227	.....	.....	3,955	1,833	3,684	1,198	1,617	.....
Dutch	275	.....	.....	238	215	368	.....	474	.....
French	.....	.....	.....	.....	.....	.....	26	.....	.....
Paraguay	19,927	440	2,399	1,330	711	1,46	.....	1	.....
Peru	4,327	47	162	14,270	7,719	11,826	7,146	18,504	.....
Uruguay	7,167	.....	.....	419	263	32,635	780	12,386	.....
Venezuela	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals, South America	\$205,233	2,154	\$7,800	56,045	\$29,750	\$214,068	\$50,397	\$220,138	.....
ASIA:									
Aden	.....	.....	.....	.....	.....	264	.....	.....	.....
China	\$18,827	14	\$62	317	\$260	18,971	\$2,448	5,108	.....
China, leased territory--	.....	.....	.....	.....	.....	.....	.....	.....	.....
French	.....	.....	.....	.....	.....	.....	.....	.....	.....
Japanese	335	.....	.....	84	41	.....	.....	13	.....
Chinese	6,192	3	14	35	35	2,186	.....	66	.....
East Indies—British	.....	.....	.....	.....	.....	.....	.....	.....	.....
British India	15,967	.....	.....	712	362	15,441	468	13,513	.....
Straits Settlements	264	.....	.....	.....	.....	8,562	.....	2,660	.....
Other British	131	.....	.....	.....	.....	1,883	75	.....	.....
East Indies—Dutch	1,497	.....	.....	.....	.....	7,688	804	1,670	.....
Hongkong	3,096	.....	74	.....	.....	276	316	3,675	.....
Japan	38,581	752	1,227	20,623	11,032	1,241	3,558	56,645	.....
Russia in Asia	1,511	2	14	.....	.....	.....	.....	4,406	.....
Siam	.....	.....	.....	6	3	742	32	257	.....
Turkey in Asia	1,240	.....	.....	20,012	9,523	4,037	.....	.....	.....
Totals, Asia	\$82,523	796	\$1,391	41,796	\$21,255	\$73,430	\$13,065	\$92,444	.....

EXPORTED TO—	Belting, Hose and Packings, Value.	Boots.		Shoes.		Tires.		Other goods, value.	Total value.
		Pairs.	Value.	Pairs.	Value.	Automobile, value.	Other, value.		
EUROPE.									
QUEENSLAND:									
British Oceania									
Australia and Tasmania	\$13,202	6,494	\$15,952	199,694	\$15,952	\$24,320	\$4,450	\$8,325	
New Zealand	38,204	9,217	27,298	15,514	27,051	10,125	12,477	1,996	
Other British	71	25	76	6,051	3,066	194		44	
French Oceania	873			5,553	5,706			496	
German Oceania	114			161	166		102		
Philippine Islands	58,606	550	1,600	22,315	20,419	250,832	81,914	120,277	
Totals, Oceania	\$289,862	16,466	\$44,926	261,729	\$154,427	\$702,877	\$98,741	\$289,862	
AFRICA:									
British Africa—									
West	\$2,904					\$1,149	\$200	\$66	
South	304,430	2,925	\$6,993	13,182	\$3,474	82,521	20,440	28,317	
East	3					4,908			
Canary Islands	8								
Egypt	30					63		106	
French Africa									
German Africa									
Liberia	2,065							15	
Morocco									
Portuguese Africa	40,069	60	187			946		585	
Totals, Africa	\$344,741	2,985	\$7,180	13,182	\$3,474	\$39,813	\$20,673	\$31,429	
Grand totals, 1914-15	\$1,807,848	318,727	\$726,765	2,219,900	\$2,053,560	\$4,963,270	\$576,602	\$3,525,486	
Grand totals, 1913-14	2,372,887	101,361	279,206	1,634,258	834,289	3,505,267	563,372	3,453,472	\$11,008,493
Grand totals, 1912-13	2,605,551	109,528	274,330	2,231,467	1,163,953	3,943,220	611,458	3,913,036	12,511,548
Boots and Shoes.									
		Pairs.	Value.						
Grand totals, 1911-12	315,484	2,545,076	\$1,502,890			2,657,809	546,833	4,144,273	11,167,289
Grand totals, 1910-11	216,546	3,984,382	17,436			2,085,107	562,470	10,927,38	
Grand totals, 1909-10	1,900,845	3,791,084	1,984,739					5,115,331	9,060,895
Grand totals, 1908-09	1,498,445	2,396,435	1,292,673					3,823,956	6,615,074
Grand totals, 1907-08	1,347,755	3,080,253	1,604,290					3,240,040	6,705,106
Grand totals, 1906-07	1,233,269	2,310,420	1,231,898					3,729,643	6,214,910
Grand totals, 1905-06	1,231,159	2,693,690	1,505,082					2,966,144	5,692,383
Grand totals, 1904-05	994,160	3,480,539	1,214,342					2,572,375	4,780,817
Grand totals, 1903-04	880,010	2,310,420	1,231,898					3,729,643	6,214,910
Grand totals, 1902-03	819,985	2,307,401	1,056,491					2,299,875	4,176,351
Grand totals, 1901-02	634,146	2,594,708	1,046,315					1,781,941	3,462,402
Grand totals, 1900-01	565,726	1,439,100	7,440					1,727,527	3,017,268

¹ Stated separately after 1912. ² Tires were not specifically reported before 1916-11.

SUMMARY.

	1912-13.		1913-14.		1914-15.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
IMPORTS OF FOREIGN MERCHANDISE—						
India rubber, etc., and substitutes for, and manufactures of:						
Unmanufactured (free):						
Balata	1,318,598	\$766,772	1,533,074	\$793,126	2,473,224	\$963,384
Guayule gum	10,218,911	4,345,088	1,475,804	607,076	5,111,849	1,441,367
Gutta jelutong	45,345,338	21,444,541	24,026,571	11,555,402	14,851,364	7,311,995
Gutta percha	480,833	167,313	1,846,109	323,567	1,618,214	307,500
India rubber	113,384,359	90,170,316	131,995,742	71,219,851	172,068,428	89,030,269
India rubber scrap or refuse, fit only for remanufacture	43,385,456	3,709,238	25,958,261	2,063,198	11,006,928	726,913
Total unmanufactured imports	214,132,795	\$101,333,168	187,735,511	\$76,162,220	207,128,907	\$87,124,680
Manufactures of (dutiable):						
Gutta percha		\$72,360		\$42,023		\$10,841
India rubber		1,217,236		1,517,788		791,281
Substitutes, elastic and similar		97,452		97,642		30,349
Total manufactured imports		\$1,391,988		\$1,647,454		\$832,471
RE-EXPORTS OF FOREIGN MERCHANDISE—						
India rubber, etc., and substitutes for, and manufactures of:						
Unmanufactured (free):						
Balata	118,134	\$77,063	223,983	\$127,139	1,076,619	\$426,735
Guayule gum	83,769	\$4,669	56,399	22,378	29,891	8,901
Gutta jelutong	3,000	163	33,330	1,065	9,122	4,223
Gutta percha	2,382	2,665	14,319	4,060	4,433	4,223
India rubber	8,476,179	4,476,179	3,747,749	2,398,150	6,383,145	3,361,107
India rubber scrap or refuse, fit only for remanufacture	87,930	10,723	24,316	2,450	3,483	373
Total unmanufactured re-exports	5,587,772	\$4,622,562	4,099,096	\$2,557,372	7,502,595	\$3,801,219
Manufactures of (dutiable):						
Gutta percha		\$22,906				
India rubber		7,973		6,738		87,489
Substitutes, elastic and similar		559				464
Total manufactures re-exported		\$23,438		\$7,476		\$7,853
EXPORTS OF DOMESTIC MANUFACTURES—						
India rubber, manufactures of:						
Scrap and odd	7,269,465	\$880,443	6,207,672	\$598,287	3,422,091	\$291,421
Reclaimed	5,413,247	932,904	5,583,860	834,440	5,970,380	822,361
Belting, hose and packings		2,605,551		2,372,887		1,807,848
Boots and shoes—						
Boots	109,528	274,330	101,361	279,206	318,727	726,765
Shoes	2,231,467	1,163,953	1,634,258	834,289	2,219,900	2,053,560
Tires—						
For automobiles				3,505,267		4,963,270
All other				563,372		576,602
All other manufactures of				4,853,473		3,525,486
Total domestic manufactures exported		\$14,324,894		\$18,841,441		\$14,767,513

Review of the Crude Rubber Market.

NEW YORK.

THE crude rubber market has been decidedly quiet in all quarters during the month of April. True, there have been a few large orders placed, but, in general, trading has been quietly done in small lots, and prices have steadily declined. The big buying interests seem to have deserted the April market.

The direct shipments to America from the East by way of the Pacific coast still continue in large volume. From January 31 to February 14, inclusive, there were 779,715 pounds shipped from Penang. From Singapore 5,030,412 pounds were shipped between February 7-27, making a total of 5,810,127 pounds now arriving at the Pacific ports. Pacific shipments are not entirely satisfactory, as more time is required than by the Cape route, averaging about a month longer. Akron shipments, however, are favored, as they are not affected by the eastern freight congestion.

The arrivals at New York, compared to 6,000 tons for the first three weeks of March, are falling off as indicated by the figures for April 1 to 18, inclusive, which total 3,700 tons and are divided as follows: Plantations from London and Liverpool, 600 tons; Singapore and Colombo, 1,715 tons; Batavia, Java, 595 tons; Para and Manaus, 335 tons; Africans, 260 tons; Centrals, 125 tons; Manicoba, 70 tons.

The steamship "Suldanha da Gama," overdue in New York with 120 tons of rubber, was captured off the Orkney Islands last month by a British cruiser.

Early in the month first latex spot, was selling at 85½¢/86½ cents, and Smoked sheet, ribbed spot, was 84½¢/85½ cents. May-June deliveries of these grades were quoted from ½ to 1 cent less than spot prices. Upriver fine spot, and May deliveries were quoted at 73½ cents.

The downward trend of prices continued with minor fluctuations during the month, and on April 25 first latex spot, was quoted at 80 cents, smoked sheet ribbed spot, at 79 cents, and Upriver fine, 71 cents.

LONDON.

The inquiry was fair during the early part of April, with small lots of Standard crepe spot, going at 3s. 4¼d. (82.6 cents), and Smoked sheet spot, at 3s. 4¼d. (81.5 cents). May-June deliveries were at a ¼d. premium for both grades. Sellers of Hard fine Para were asking 3s. 1d. (75 cents). On April 25 Standard crepe spot sold for 37¼d. (75 cents) and Smoked sheet for 37d. (74 cents), an average decline of 7 cents the pound since April 1.

The absence of large buyers was marked during the entire month, and consequently the market lacked the support necessary to hold up prices. The diversion of shipments to America via Pacific routes, the increase of ocean rates and the advance in war risks, have had a disquieting effect on London.

The consumption of crude rubber in the United Kingdom for the past three years has steadily declined, according to figures furnished by the London Board of Trade. In 1915 the quantity of crude rubber retained in England for home consumption was 17,982 tons, as compared to 18,850 tons in 1914 and 25,275 tons in 1913.

SINGAPORE.

At the auction held March 1-2, 1,274,000 pounds were offered and 619,733 pounds sold. Fine pale crepe brought 79½ cents, and Smoked sheet ribbed sold for 79 cents. On March 8-9, of 1,137,600 pounds offered, 845,333 pounds were sold. Fine pale crepe went readily at 79 cents, and Smoked sheet ribbed sold up to 80 cents. The market closed firm and active. The auction, March 15-16, brought out 972,666 pounds, 778,800 pounds being sold. Fine pale crepe sold at 80 cents, and Smoked sheet ribbed at 79 cents. The market was steady at the close.

SINGAPORE-NEW YORK FREIGHT RATES.

The following are the new freight rates from Singapore to Boston and New York via the Suez or Panama Canal:

Rubber scrap (cases).....	\$48.60 per 50 cubic feet
Gutta jelutong (cases) (Pontianak).....	\$2.24 per 50 cwt.
Rubber shavings, not exceeding \$300 per ton (cases)	53.46 per 50 cubic feet
Gutta re-boiled or mixed, not exceeding 24 cents per pound (c. i. f. in cases)....	55.89 per 50 cubic feet
Borneo rubber (baskets).....	65.61 per 12 cwt.
Borneo, Para, and rubber, genuine (cases).....	65.61 per 50 cubic feet
Gutta percha (cases).....	68.04 per 50 cubic feet
Rubber, genuine (bags or bundles).....	97.20 per 20 cwt.

The new through rate on rubber in cases from Port Swettenham, Malacca, Teluk Anson, Port Dickson, is \$79.25 per 50 cubic feet. In cases by steamers calling at Port Swettenham is \$65.61 per 50 cubic feet. [The equivalent of a ton (2,240 pounds) is figured at 40 cubic feet, a hundred weight (cwt.) 112 pounds.]

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and April 28, the current date:

	May 1, '15.	April 1, '16.	April 28, '16.
UPRIVER, fine, new	60 @	74 @ 74½	70 @ 70½
Upriver, fine, old	62 @	74 @	64½ @
Islands, fine, new	53 @	70 @	64½ @
Islands, fine, old	53 @	70 @	64½ @
Upriver, coarse, new	46 @	57½ @	54½ @ 55
Upriver, coarse, old	46 @	57½ @	54½ @
Islands, coarse, new	30 @	38 @	34½ @
Islands, coarse, old	30 @	38 @	34½ @
Cambo, ball, upper	48 @	59 @	56 @
Cambo, ball, lower	48 @	59 @	54 @
CAUCHO, ball, lower	48 @	59 @	54 @
PLANTATION.			
First latex crepe, } Spot, 58½ @ } Spot 88 @ } Spot 78½ @ 79			
Amber crepe, light } Afloat 57 @ }			May-June 78½ @ 79
Brown crepe, clean			Spot 76½ @ 77
Smoked sheet, ribbed } Spot, 59 @ }			May-June 75½ @ 76
Unsmoked sheet, ribbed } Afloat 57 @ }			Spot 76½ @ 77
Fine sheets and biscuits, unsmoked			May-June 78½ @ 79
CENTRALS			
Colombo	46 @	58 @	51 @
Esmeralda, sausage	45 @	58 @	50 @ 50½
Nicaragua, scrap	44 @	57 @	50 @
Mexican plantation, sheet	46 @	58 @	64 @ 65
Mexican, scrap	46 @	58 @	48 @ 49
Manicoba, slab	37½ @	41 @	36 @ 37
Manicoba, sheet	37½ @	41 @	40 @ 42
Mangalore, sheet	37½ @	41 @	42 @ 43
Guyule	28 @ 29	33 @	38 @ 39
Palata, sheet	48 @	70 @	67 @
Palata, block	48 @	44 @ 58	54 @
AFRICAN.			
Loport, ball, prime		75 @	70 @
Loport, strip, prime		75 @	70 @
Upper Congo, ball, red		65 @	68 @
Rio Niger Niggers		73 @	67 @
Conkly Niggers		72 @	67 @
Masai, red	54 @	72 @	68 @ 69
Soudan, Niggers		72 @	68 @
Cameroon, ball, soft		72 @	68 @
Cameroon, ball, hard		72 @	68 @
Benguela, No. 1	30 @	50 @	48 @
Benguela, No. 2	30 @	50 @	48 @
Accra, flake	23 @	41 @	38 @
EAST INDIAN.			
Assam	50 @	55 @	50 @
Pontianak	71 @	10½ @	8½ @
Gutta Sak		16 @	17 @
Gutta red Niger		27 @	27 @
Borneo HJ		35 @	30 @
Gutta Percha		1.50 @ 2.00	1.50 @ 2.00

RUBBER AFLOAT TO THE UNITED STATES.

	FROM PENANG.	TO.	Pounds.
Steamship	Cleared.		
Kathlambla	Jan. 31, 1916.	New York	223,066
Alcimos	Feb. 8, 1916.	New York	8,933
Alcimos	Feb. 8, 1916.	Akron	8,933
Demodocus	Feb. 9, 1916.	New York	11,200
Nore	Feb. 13, 1916.	New York	22,000
Tuscan Prince	Feb. 14, 1916.	New York	485,450
Tuscan Prince	Feb. 14, 1916.	Boston	20,133
Totals from Penang.			779,715

Steamship.	From Singapore.	To.	Pounds.
Hong Moh.	Feb. 7, 1916.	New York	172,966
Tuscan Prince	Feb. 11, 1916.	New York	685,600
Demodocus	Feb. 12, 1916.	Akron	100,466
Yamato	Feb. 12, 1916.	New York	11,333
Algonquin	Feb. 13, 1916.	Seattle	708,266
Algonquin	Feb. 13, 1916.	Seattle	21,966
Namun	Feb. 19, 1916.	New York	210,933
Nove	Feb. 16, 1916.	New York	26,666
Nove	Feb. 16, 1916.	Akron	141,200
Glenholm	Feb. 17, 1916.	Akron	32,666
Helenus	Feb. 19, 1916.	New York	22,400
Ceylon Maru	Feb. 21, 1916.	Akron	7,900
India	Feb. 22, 1916.	Akron	8,733
India	Feb. 22, 1916.	New York	1,772,133
Nevada	Feb. 23, 1916.	Seattle	111,986
Maclure	Feb. 23, 1916.	Seattle	25,966
Maclure	Feb. 27, 1916.	Akron	180,000
Maclure	Feb. 27, 1916.	New York	4,533
Wash Prince	Feb. 27, 1916.	New York	547,096
Totals from Singapore			5,630,412

GUTTA JELUTONG (PONTIANAKI).			
Steamship.	From Singapore.	To.	Pounds.
Hong Moh.	Feb. 7, 1916.	San Francisco	57,200
Tuscan Prince	Feb. 11, 1916.	New York	135,211
Demodocus	Feb. 12, 1916.	Seattle	331,500
Yamato	Feb. 12, 1916.	Boston	104,466
India	Feb. 22, 1916.	Boston	112,933
India	Feb. 22, 1916.	New York	392,533
Wash Prince	Feb. 27, 1916.	Seattle	23,966
Wash Prince	Feb. 27, 1916.	Boston	424,466
Wash Prince	Feb. 27, 1916.	New York	424,466
Totals from Singapore			1,793,465

GUTTA PERCHA.			
Steamship.	From Singapore.	To.	Pounds.
Tuscan Prince	Feb. 11, 1916.	Boston	22,400
Tuscan Prince	Feb. 11, 1916.	New York	70,133
India	Feb. 22, 1916.	New York	11,200
Wash Prince	Feb. 27, 1916.	New York	45,200
Totals from Singapore			149,800

BORNEO.			
Steamship.	From Singapore.	To.	Pounds.
Tuscan Prince	Feb. 11, 1916.	New York	11,720
India	Feb. 22, 1916.	New York	11,200
Totals from Singapore			22,920

*Via Hongkong. *Via Singapore. *Via Kobe.

GUTHRIE & CO., LIMITED, REPORT (MARCH, 1916).

In Singapore per packet.	Sterling equivalent per pound in London.	Equivalent per pound in cents.
Sheet, fine ribbed smoked.	177/8 @ 185	3 4/8 @ 3 9/8
Sheet, good ribbed smoked.	170/0 @ 177	3 3/8 @ 3 4/8
Sheet, plain smoked.	168/0 @ 176	3 2/8 @ 3 3/8
Sheet, ribbed, unsmoked.	161/0 @ 174	3 1/8 @ 3 3/8
Sheet, plain, unsmoked.	153/0 @ 172	3 1/8 @ 3 4/8
Crêpe, fine pale.	154/0 @ 175	3 6/8 @ 3 9/8
Crêpe, good pale.	147/0 @ 174	3 4/8 @ 3 5/8
Crêpe, fine brown.	124/0 @ 180	3 4/8 @ 3 5/8
Crêpe, good brown.	115/0 @ 175	3 1/8 @ 3 4/8
Crêpe, dark.	106/0 @ 165	2 11/16 @ 3 1/8
Crêpe, bark.	135/0 @ 161	2 7/8 @ 3 1/8
Scrap, virgin.	110/0 @ 137	2 1/2 @ 2 3/4
Scrap, lower.	137/0 @	8 1/4 @

* Dual = 13 1/2 pounds.
 * Figured at standard rate of exchange, 1s. = 24 1/2 cents.
 Quoted in S. S. dollars = 2/4 1/2 cents lb.

PARAS.	Pounds.
MARCH 23.—By the <i>Alliance</i> =Colon:	
G. Aminek & Co. (Fine).....	5,000
G. Aminek & Co. (Cauchou).....	2,000
G. Aminek & Co. (Coarse).....	1,000
Neuss, Hessel & Co. (Fine).....	4,000
Neuss, Hessel & Co. (Coarse).....	2,000
MARCH 27.—By the <i>Raphael</i> =Montevideo:	
A. D. Straus & Co. (Fine).....	8,000
A. D. Straus & Co. (Coarse).....	1,500
MARCH 10.—By the <i>Ancon</i> =Colon:	
W. R. Grace & Co. (Fine).....	4,500
W. R. Grace & Co. (Coarse).....	1,000

CENTRALIS.

* This sign, in connection with imports of Centralis, denotes Guayule rubber.

MARCH 21.—By the <i>Trivier</i> =Cortez:	
M. Keith.....	1,200
Brodermann Latzold.....	1,000
Egger & Heinen.....	1,000
G. Aminek & Co. (Fine).....	400
G. Aminek & Co. (Coarse).....	200
A. Rosenthal & Sons.....	3,000
Cox & Herbert.....	2,000
J. S. Sembrada & Co.....	1,500
MARCH 21.—By the <i>Pacific</i> =Port Lamon:	
A. A. Linde & Co.....	1,000
Isaac Brandon & Bros.....	1,000
Starck & Co.....	500

MARKET CABLE SERVICE FROM SINGAPORE.

The following reports of the weekly auctions held at Singapore have been cables by the Rubberhouse Co., Limited.

Date.	Crêpe.	Smoked Sheet.	Pounds.	Market.
March 30.	79.5	80.3	692,160	Firm improved demand.
April 1.	76.5	76.5	414,400	Weak.
April 19.	75	73.5	504,000	Weaker less demand.

COMPARATIVE NEW YORK PRICES FOR APRIL.

	1916.	1915.	1914.
Upriver fine.....	\$0.67 @ 0.74	\$0.57 @ 0.60	\$0.74 @ 0.76
Upriver coarse.....	55 @ 57	46 @ 48	44 @ 47
Islands fine.....	63 @ 69	52 @ 55	69 @ 73
Islands coarse.....	36 @ 40	30 @ 33	31 @ 34
Camda.....	38 @ 40	33 @ 37	33 @ 37

* Figured only to April 25.

Crude Rubber Arrivals at the Port of New York.

(The Figures Indicate Weights in Pounds.)

MARCH 31.—By the steamer <i>Rio de Janeiro</i> from Pará:				
	Fine.	Medium.	Coarse.	Cauchou.
Meyer & Brown.....	37,000	3,600	25,000	50,100
G. Aminek & Co.....	126,500	7,200	54,100	60,200
Arnold & Zeiss.....	88,200	15,800	30,500	31,800
Henderson & Korn.....	100	400	53,000	2,800
Aldens' Successors, Ltd.....	3,000	750	15,100	4,370
H. A. Aslett & Co.....	7,100		3,700	23,200
W. R. Grace & Co.....	4,200		200	7
Totals.....	266,100	29,750	180,000	154,970

MARCH 31.—By the steamer *Francis* from Pará and Manóas:

	Fine.	Medium.	Coarse.	Cauchou.	Total.
Meyer & Brown.....	166,400	18,100	306,000	219,400	709,900
Arnold & Zeiss.....	281,600	38,100	142,600	94,500	557,800
W. R. Grace & Co.....	97,900	700	18,800	166,100	283,500
Paul Barton & Co.....	180,100	700	37,200	33,600	271,600
G. Aminek & Co.....	91,000	14,500	30,900	113,800	270,200
H. A. Aslett & Co.....	79,100	30,700	104,700	47,100	251,600
Henderson & Korn.....	115,300	9,800	47,400	20,200	212,700
Rodinson & Co.....	92,300	15,100	56,200	51,200	214,800
Edward Mather Co., Inc.....	2,500	2,800	1,400		6,700
Pell & Dumort.....	45,000	900	18,400		64,300
Neuss, Hessel & Co.....	50,800		3,500	1,000	61,300
Hageneyer & Brunn.....	13,000	12,000	15,200		40,200
E. T. Joint Ten. & Co.....	1,400		1,400		2,800
E. B. Ross & Co.....	5,800	1,000	11,200		18,000
A. A. Straus & Co.....	3,100				21,100
Aldens' Successors, Ltd.....		2,000	3,300		7,500
Totals.....	1,457,400	175,300	916,000	746,900	3,295,600

APRIL 15.—By the steamer *Minas Geraes* from Pará:

	Fine.	Medium.	Coarse.	Cauchou.	Total.
Meyer & Brown.....	91,200	13,200	76,200	29,400	210,000
Central Rubber Co.....	95,500	2,300	74,000		171,800
G. Aminek & Co.....	30,500	7,600	13,400	74,000	125,500
Arnold & Zeiss.....	90,400	12,000	31,300	500	124,200
Muller, Schell & Co.....	1,000		1,000		2,000
Henderson & Korn.....	1,100	1,100	12,400	1,600	17,200
H. A. Aslett & Co.....	4,400		9,900		13,300
P. B. Benth.....	10,000	1,100			11,100
Totals.....	383,900	44,300	216,300	125,600	669,200

PARAS.

PARAS.	Pounds.
MARCH 21.—By the <i>Montez</i> =Mexico:	
J. A. Medina & Co.....	1,200
Amicon Trading Co.....	1,000
G. Aminek & Co. (Coarse).....	800
Lawrence Johnson & Co.....	200
MARCH 23.—By the <i>Alliance</i> =Colon:	
G. Aminek & Co.....	4,000
A. M. Capen's Sons.....	2,200
Public Calvet & Co.....	8,500
Mecke & Co.....	4,000
H. Wolf & Co.....	4,000
Porter, Eber & Co.....	1,300
Dumarest Bros.....	1,300
Grahamsthor & Co.....	5,000
W. R. Grace & Co.....	500
J. S. Sembrada & Co.....	800
Fidancie Bros & Sons.....	500
MARCH 24.—By the <i>Zapala</i> =Cortez:	
Andean Trading Co.....	5,000
Mack & Co.....	4,000
Herman Wolf.....	1,500
G. Aminek & Co.....	1,000
MARCH 28.—By the <i>Calumet</i> =Port Lamon:	
Isaac Brandon & Bros.....	1,500
MARCH 29.—By the <i>Colan</i> =Colon:	
Lawrence Johnson & Co.....	19,000
Public Calvet & Co.....	5,000
G. Aminek & Co.....	3,400
Otto Gerding.....	1,100
W. A. Grace & Co.....	900
Isaac Brandt & A. Brandt.....	2,000
Piza, Nepheus & Co.....	7,500
Muller, Schell & Co.....	18,000

PARAS.

PARAS.	Pounds.
MARCH 30.—By the <i>Carrillo</i> =Colon:	
G. Aminek & Co.....	5,000
Andean Trading Co.....	5,000
Herman Wolf.....	500
Caballero & Blanco.....	500
APRIL 3.—By the <i>Isopora</i> =Mexico:	
J. A. Medina & Co.....	1,500
G. Aminek & Co.....	500
E. Steiger & Co.....	700
APRIL 3.—By the <i>Sisalua</i> =Cortez:	
G. Aminek & Co.....	500
Rosenthal & Sons.....	500
W. H. Knox & Co.....	300
Egger & Heinen.....	200
E. H. Viver.....	400
APRIL 4.—By the <i>Tenadores</i> =Port Lamon:	
G. Aminek & Co.....	1,700
Kunhardt & Co.....	500
A. A. Linde & Co.....	1,000
Isaac Brandon & Bros.....	500
APRIL 6.—By the <i>Comuz</i> =New Orleans:	
E. Steiger & Co.....	60,000
APRIL 8.—By the <i>Cochi</i> =Galveston:	
Various.....	6,000
APRIL 30.—By the <i>Santa Marta</i> =Cortez:	
H. Wolf & Co.....	1,000
R. Williamson.....	500

APRIL 10.—By the <i>Colin</i>	Pounds.
G. Amisack & Co.	10,000
M. R. Schaff & Co.	2,000
A. M. Capen's Sons.	4,600
Meeke & Co.	6,400
Pablo, Calvet & Co.	3,100
J. S. Sembrada & Co.	2,100
Ammerican Trading Co.	2,000
H. Mann & Co.	800
W. Goiza & Co.	400
De Sola Bros. & Pardo.	1,000
Eggers & Heinlein	700
W. R. Grace & Co.	1,500
Alben's Successors, Ltd.	1,000
Pothberg, Ebeling & Co.	1,900
Lawrence Johnson & Co.	25,400
Charles F. Griffin	1,000

APRIL 10.—By the *Gracie*—New Orleans: 42,000

F. Steiger & Co.

APRIL 11.—By the *Metrop*—Port London: 2,000

Fruit Despatch Co.

APRIL 12.—By the *Parana*—Colon: 1,000

De Sola Bros. & Pardo.

APRIL 14.—By the *Almirante*—Colon: 3,000

G. Amisack & Co.

APRIL 15.—By the *Manzanera*—Mexico: 2,000

G. Amisack & Co.

APRIL 16.—By the *Manzanera*—Mexico: 2,000

G. Amisack & Co.

APRIL 17.—By the *Manzanera*—Mexico: 2,000

G. Amisack & Co.

APRIL 18.—By the *Manzanera*—Mexico: 2,000

G. Amisack & Co.

APRIL 19.—By the *Manzanera*—Mexico: 2,000

G. Amisack & Co.

APRIL 20.—By the *Manzanera*—Mexico: 2,000

G. Amisack & Co.

APRIL 21.—By the *Manzanera*—Mexico: 2,000

G. Amisack & Co.

APRIL 22.—By the *Manzanera*—Mexico: 2,000

G. Amisack & Co.

APRIL 23.—By the *Manzanera*—Mexico: 2,000

G. Amisack & Co.

APRIL 24.—By the *Manzanera*—Mexico: 2,000

G. Amisack & Co.

APRIL 25.—By the *Manzanera*—Mexico: 2,000

G. Amisack & Co.

APRIL 26.—By the *Manzanera*—Mexico: 2,000

G. Amisack & Co.

APRIL 27.—By the *Manzanera*—Mexico: 2,000

G. Amisack & Co.

APRIL 28.—By the *Manzanera*—Mexico: 2,000

G. Amisack & Co.

APRIL 29.—By the *Manzanera*—Mexico: 2,000

G. Amisack & Co.

APRIL 15.—By the <i>Minas Gerais</i> —Bahia:	Pounds.
Lawrence Johnson & Co.	2,000
APRIL 19.—By the <i>Camara</i> —Bahia:	Pounds.
Adolph Hirsch & Co.	105,000
J. H. Rossbach Bros. & Co.	25,000 130,000

PLANTATION RUBBER.

MARCH 23.—By the <i>Manchuria</i> —London:	Pounds.
Meyer & Brown	67,000
General Rubber Co.	70,000
L. Littlejohn & Co.	19,000
Raw Products Co.	40,000
Charles T. Wilson & Co., Inc.	100,000
Alben's Successors, Ltd.	281,800
Robert Badenhop Co.	25,000
Goodyear Tire & Rubber Co.	22,500
Edward Maurer Co., Inc.	72,000
Various	11,200 857,900

MARCH 27.—By the <i>Kathlamet</i> —Singapore:	Pounds.
Meyer & Brown	33,500
Arnold & Zeiss	340,000
Preston Tire & Rubber Co.	67,000
L. Littlejohn & Co.	485,100
Charles T. Wilson Co., Inc.	60,000
Edward Maurer Co., Inc.	140,000
W. H. Grace & Co.	11,000
I. T. Johnstone & Co.	11,000
Henderson & Korn	150,000
Goodyear Tire & Rubber Co.	10,000
Hoel Rubber Co.	13,000
P. Stern & Co.	125,000
Alben's Successors, Ltd.	25,000
Eastern Insulated Wire & Cable Co.	4,500
Edward Maurer Co., Inc.	135,000
Robert Badenhop Co.	30,000
W. H. Stiles	11,300
Alben's Successors, Ltd.	13,400
Various	55,600 2,414,900

MARCH 29.—By the <i>Manchuria</i> —London:	Pounds.
Meyer & Brown	115,000
Alben's Successors, Ltd.	395,650
Edward Maurer Co., Inc.	4,000
Robert Badenhop Co.	30,000
Charles T. Wilson Co., Inc.	40,000
L. Littlejohn & Co.	29,300 672,016

MARCH 30.—By the *Queen Margaret*—Liverpool: 4,500

The B. F. Goodrich Co.

MARCH 30.—By the *Argaroch*—London: 180,000

The B. F. Goodrich Co.

MARCH 31.—By the *Andama*—London: 35,534

L. Littlejohn & Co.

MARCH 31.—By the *Andama*—London: 35,534

L. Littlejohn & Co.

MARCH 31.—By the *Andama*—London: 35,534

L. Littlejohn & Co.

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L. Littlejohn & Co.

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L. Littlejohn & Co.

MARCH 31.—By the *Andama*—London: 35,534

L. Littlejohn & Co.

MARCH 31.—By the *Andama*—London: 35,534

L. Littlejohn & Co.

APRIL 17.—By the <i>Indra</i> —Singapore:	Pounds.
MAKER & BROWN	35,000
Edward Maurer Co., Inc.	70,000
Robinson & Co.	30,000
Arnold & Zeiss	180,000
Stern & Co.	25,000
Henderson & Korn	13,000
Goodyear Tire & Rubber Co.	160,000
Rubber Trading Co.	42,000
Charles T. Wilson Co., Inc.	15,000
Robert Badenhop Co.	25,000
W. H. Grace & Co.	22,500
H. R. Jeffords	18,000
W. H. Stiles	33,600
Alben's Successors, Ltd.	13,400
Hoel Rubber Co.	13,000
I. T. Johnstone & Co.	139,000
L. Littlejohn & Co.	60,425
Various	92,379 1,836,100

APRIL 18.—By the *Lapland*—Liverpool: 2,500

I. T. Johnstone & Co.

APRIL 18.—By the *Boyne*—Liverpool: 2,500

Goodyear Tire & Rubber Co.

APRIL 18.—By the *Boyne*—Liverpool: 2,500

Goodyear Tire & Rubber Co.

APRIL 19.—By the *Delin*—Batavia: 2,184

L. Littlejohn & Co.

APRIL 19.—By the *Delin*—Batavia: 2,184

L. Littlejohn & Co.

APRIL 19.—By the *Delin*—Batavia: 2,184

L. Littlejohn & Co.

APRIL 19.—By the *Delin*—Batavia: 2,184

L. Littlejohn & Co.

APRIL 19.—By the *Delin*—Batavia: 2,184

L. Littlejohn & Co.

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APRIL 19.—By the *Delin*—Batavia: 2,184

L. Littlejohn & Co.

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L. Littlejohn & Co.

APRIL 19.—By the *Delin*—Batavia: 2,184

L. Littlejohn & Co.

APRIL 19.—By the *Delin*—Batavia: 2,184

L. Littlejohn & Co.

APRIL 19.—By the *Delin*—Batavia: 2,184

L. Littlejohn & Co.

CUSTOM HOUSE STATISTICS.

PORT OF HUBON—FEBRUARY, 1916.

EXPORTS: 1,831

Reclaimed rubber

Rubber boots

Stomachile tires

Other rubber tires

Belting, hose, etc.

All other manufactures of india rubber

Totals

PORT OF SAN FRANCISCO—FEBRUARY, 1916.

Imports: 391,336 \$209,449

PORT OF BOSTON—MARCH, 1916.

Imports: 132,152 \$100,388

Gutta percha

Gutta jelutong (Pontianak)

Totals

PORT OF CHICAGO—MARCH, 1916.

Imports: 68,142 \$4,862

PORT OF DETROIT—MARCH, 1916.

Imports: 50,632 \$6,705

Exports: 133 \$20

Rubber scrap

Imports: 93,517 \$12,612

PORT OF GALVESTON—MARCH, 1916.

Imports: 93,517 \$12,612

Imports: 2,859 \$6,016

Automobile tires

Other rubber tires

Belting, hose, etc.

All other manufactures of india rubber

Totals

PORT OF NEW ORLEANS—MARCH, 1916.

Imports: 906,894 \$314,607

PORT OF SAN FRANCISCO—MARCH, 1916.

Imports: 862,214 \$520,918

Gutta jelutong (Pontianak)

Imports: 26,930 \$1,305

PORT OF SEATTLE—MARCH, 1916.

Imports: 1,616,789 \$1,188,565

Gutta jelutong (Pontianak)

Imports: 1,241

IMPORTS AND EXPORTS OF RUBBER AND RUBBER MANUFACTURES AT THE PORT OF NEW YORK.

IMPORTS.

Week Ending—	India Rubber		Scrap for remanufacture.		Balata		Gutta Jelutong.		Gutta Percha.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
March 24, 1916.....	1,146,575	\$8,561	3,344,758	\$6,382	\$8,927	.....	648,485	\$51,061	40,096	\$193
March 31, 1916.....	9,606,931	8,150	4,595,953	235,918	20,437	10,963	283,113	16,847	142,009	11,446
April 7, 1916.....	2,172,900	9,663	4,534,546	14,018	15,568	.....	.....	.....	4,320	2,512
April 14, 1916.....	1,314,300	121	116,360	18,381	115,600	56,716	.....	.....	.....	812

* Pounds not specified.

In addition to the above, 19,638 pounds of scrap was imported from Mexico, valued at \$6,801, during the week of April 14, 1916.

EXPORTS.

FIGURES ISSUED FROM MARCH 27, 1916, TO APRIL 24, 1916.

EXPORTED TO—	Belting, Hose and Packing.		Footwear.		Tires.		Domesticated Cables.		Other Man. of India.		Laminated Pumps.		Chewing Gum.		Reclaimed Rubber.		Scrap Rubber.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Barbados.....	53	.....	175	\$129	.....	.....	.....	.....	81,600	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brazil.....	1,587	\$232	1,084	10,501	.....	.....	53,603	75,309	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colombia.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Costa Rica.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
India.....	880	.....	.....	80,294	48,417	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norfolk Islands.....	.....	.....	.....	18,598	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Panama.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peru.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rubber of India.....	.....	.....	.....	30,300	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South America.....	.....	.....	.....	1,417	.....	.....	.....	.....	14,300	.....	.....	.....	.....	.....	.....	.....	.....	.....
Switzerland.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
United Kingdom.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
England.....	34,778	3,900	7,014	505,416	49,380	78,314	20,077	3,90	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Scotland.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals, Europe.....	\$89,048	\$3,439	\$8,273	\$646,655	\$58,221	\$157,922	\$281,763	\$3,800	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NORTH AMERICA:	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bermuda.....	505	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British Honduras.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Canada.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Central American States—	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Costa Rica.....	707	.....	.....	1,294	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Guatemala.....	162	.....	.....	342	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Honduras.....	315	.....	.....	267	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nicaragua.....	848	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Panama.....	32,831	\$176	.....	14,620	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salvador.....	154	.....	.....	1,472	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mexico.....	8,756	15	.....	14,120	2,611	1,736	3,035	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miquelon Island.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Newfoundland and Labrador.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Indies—	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British—	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Barbados.....	11	.....	.....	445	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jamaica.....	318	.....	63	3,778	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Trinidad and Tobago.....	480	.....	.....	163	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other British.....	187	.....	.....	3,686	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cuba.....	11,761	622	243	34,749	3,054	8,834	20,415	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Danish.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dutch.....	909	.....	.....	255	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
French.....	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Guati.....	47	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Santo Domingo.....	1,078	.....	.....	2,041	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals, North America.....	\$58,086	\$1,134	\$2,586	\$76,875	\$7,410	\$34,655	\$43,197	\$918	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
SOUTH AMERICA:	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Argentina.....	86,694	.....	.....	\$46,133	\$8,793	\$1,970	\$8,935	\$1,064	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bolivia.....	45	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brazil.....	4102	.....	.....	10,238	26,552	16,046	15,444	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chile.....	1,386	.....	1,816	6,885	190	15,167	3,929	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colombia.....	4,469	.....	.....	2,219	1,799	1,227	2,612	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ecuador.....	1,330	.....	.....	65	193	363	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Guiana—British.....	18	.....	1,070	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Paraguay.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peru.....	1,271	.....	.....	1,189	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Uruguay.....	1,292	\$47	.....	9,931	2,078	1,490	1,992	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Venezuela.....	165	.....	.....	10,344	146	1,296	2,622	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals, South America.....	\$2,975	\$47	\$5,319	\$81,803	\$39,751	\$38,888	\$38,947	\$1,950	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
ASIA:	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aden.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
China.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British East India.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British India.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Straits Settlements.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dutch East India.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Japan.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Russia in Asia.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals, Asia.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
OCEANIA:	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British—	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Australia and Tasmania.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Zealand.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Philippine Islands.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals, Oceania.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
AFRICA:	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British Africa—	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Africa.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Canary Islands.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Egypt.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portuguese Africa.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belgian Congo.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals, Africa.....	\$32,254	\$705	.....	\$11,230	\$983	\$445	\$4,072	\$354	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

In addition to the above the following items were exported during the same period: To England—Balata, \$26,000; to Panama—Balata, \$90; to Cuba—Vulcanized rubber, \$1,600; to Cuba—Gutta percha, \$297.

Plantation Rubber from the Far East

TOTAL EXPORTS FROM MALAYA.

(From January 1, 1916, to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	From Singapore.	From Malacca.	From Penang.	From Port Swettenham.	Total.
United Kingdom.....	31,191.6	31,191.6	31,191.6	29,191.6	121,574.4
The Continent.....	2,154,533	408,800	2,057,067	5,270,234	9,890,634
Japan.....	375,500	.....	.....	.....	375,500
Ceylon.....	311,067	.....	64,933	396,846	772,846
United States.....	8,600,267	.....	591,733	9,192,000	18,384,000
Australia.....	36,000	.....	.....	.....	36,000
Totals.....	11,494,667	408,800	2,713,733	5,667,080	20,284,280
For the same period, 1915 4,408,938	537,281	2,513,598	5,810,062	13,269,869	21,339,750
For the same period, 1914 2,771,704	.....	1,746,266	5,084,254	9,602,224	17,164,450
For the same period, 1913 2,020,289	.....	1,027,733	4,216,179	7,266,201	14,530,393

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to March 20, 1915 and 1916. Compiled by the Ceylon Chamber of Commerce.)

To—	1915.	1916.
United States.....	1,745,084	6,514,304
Canada and Newfoundland.....	340,140	2,240
France.....	35,840	398,050
Russia.....	137,259	18,685
United Kingdom.....	7,404,104	4,498,779
Australia.....	43,486	198,280
Japan.....	119,582	45,396
Straits Settlements.....	78,990	.....
Totals.....	9,905,073	11,676,294

(Same period 1914, 8,123,655 pounds; same period 1913, 5,692,636.) The export figures of rubber, given in the above table for 1914, include the imports re-exported. (These amount to 928,613 pounds from the Straits Settlements and 246,346 pounds from India.) To arrive at the total quantity of Ceylon rubber exported for that year deduct these imports from the total exports. The figures for 1915 and 1916 are for Ceylon rubber only.

RUBBER AND GUTTA EXPORTS FROM JAVA AND MADURA.

PLANTATION, TO—	December.		Twelve Mos. Ending December 31.	
	1914 Pounds.	1915 Pounds.	1914 Pounds.	1915 Pounds.
Holland.....	1,773	44,020	44,020	45,371
Hevea.....	48,400	6,600	2,334,200	2,750,000
Hevea (to order).....	.....	.....	499,400	4,400
Manihot (Ceara).....	.....	.....	134,275	16,733
Castillea.....	7,150	.....	58,780	15,244
Totals.....	57,323	6,600	3,070,675	2,831,688
Great Britain.....	715	2,281	42,495	64,009
Hevea.....	233,362	316,800	3,942,400	4,557,600
Manihot (Ceara).....	5,958	8,474	35,776	37,149
Castillea.....	6,543	19,006	34,456	103,506
Totals.....	246,410	346,561	4,055,127	4,732,264
Belgium.....	.....	.....	463	.....
Hevea.....	.....	.....	547,800	.....
Totals.....	.....	.....	548,263	.....
France.....	.....	.....	6,600	11,000
Hevea.....	.....	.....	1,934	1,934
United States.....	1,934	253,000	226,600	992,200
Manihot (Ceara).....	.....	.....	807	10,110
Castillea.....	.....	.....	1,811	.....
Totals.....	265,934	792,000	428,734	7,352,052
Germany.....	.....	.....	79,200	.....
Hevea.....	.....	.....	2,735	.....
Castillea.....	.....	.....	.....	.....
Totals.....	.....	.....	81,935	.....
Singapore.....	.....	.....	5,665	21,113
Hevea.....	24,200	253,000	226,600	992,200
Manihot (Ceara).....	.....	.....	807	10,110
Castillea.....	.....	.....	1,811	.....
Totals.....	6,778	255,955	234,336	1,024,423
Australia.....	.....	.....	.....	317
Japan.....	.....	.....	13,200	257,400
Other countries.....	1943	5,863	2,191	8,065
Hevea.....	.....	.....	.....	187,000
Manihot (Ceara).....	.....	.....	.....	282
Totals.....	1943	5,863	2,191	195,347
Grand totals.....	598,364	1,466,379	8,427,860	16,404,491

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram from Kuala Lumpur states that 4,429 tons of plantation rubber were exported in the month of March as against 5,207 tons in February and 3,418 tons in the corresponding month last year. Exports for the first quarter amounted to 14,107 tons, compared with 10,302 tons in 1915 and 7,324 tons in 1914. Appended are the comparative statistics:

	1914.	1915.	1916.
January.....	2,542	3,473	4,471
February.....	364	3,411	5,207
March.....	2,418	4,348	4,429
Totals.....	7,324	10,302	14,107

IMPORTS AND EXPORTS OF RUBBER AND GUTTA AT SINGAPORE.

IMPORTS.

January, 1916.

From	Para Rubber.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.
Federated Malay States—	.....	.....	.....	.....
Port Swettenham.....	1,683,266	.....	.....	.....
Malacca.....	1,360,266	.....	.....	.....
Teluk Anson.....	997,466	.....	.....	.....
Muar.....	949,733	.....	.....	.....
Kelantan.....	153,533	.....	.....	.....
Port Dickson.....	150,266	.....	.....	.....
Siam.....	.....	.....	.....	.....
Totals.....	5,294,330	.....	.....	.....

Sumatra.....	86,200	31,463	142,800	206,000
Randjeremassin.....	40,000	.....	.....	.....
Indragiri.....	38,133	.....	.....	50,266
Belawan.....	12,533	.....	.....	.....
Palembang.....	56,933	1,066	10,000	530,400
Sambas.....	1,200	.....	.....	27,311
Totals.....	184,799	32,529	152,800	786,666

Borneo.....	135,733	.....	19,200	600,400
Sarawak.....	29,066	3,466	17,290	448,533
Sibu.....	71,533	9,066	9,733	70,933
Pontianak.....	56,933	.....	4,666	.....
Samarinda.....	3,333	7,400	1,866	.....
Totals.....	7,296,398	19,932	52,755	1,147,597

British North Borneo—

Jesselton.....	104,000	.....	800	.....
Labuan.....	16,933	.....	666	82,166
Kudat.....	13,333	.....	.....	.....
Totals.....	134,266	.....	1,466	82,166

Java—	.....	.....	.....	.....
Deli.....	1,113,800	.....	.....	.....
Batavia.....	118,666	.....	.....	.....
Sourabaya.....	92,533	.....	.....	.....
Totals.....	1,324,999	.....	266	.....

Kobe.....	23,344	.....	8,000	.....
Yokohama.....	2,266	4,533	2,666	.....
Totals.....	24,610	4,533	10,666	.....

Siam—	.....	.....	.....	.....
Patani.....	1,466	.....	.....	.....
Bangkok.....	.....	6,666	.....	.....
Totals.....	1,466	6,666	.....	.....

Straits Settlements—	.....	.....	.....	.....
Penang.....	920,400	.....	.....	.....
Burma—	.....	.....	.....	.....
Rangoon.....	3,600	.....	.....	.....
Djambi.....	142,133	.....	7,866	6,666
Other ports.....	800,933	4,400	15,200	372,400
Grand Totals.....	9,128,134	68,600	230,353	2,306,161

Exports.	.....	.....	.....	.....
Europe—	.....	.....	.....	.....
United Kingdom—	.....	.....	.....	.....
England.....	2,050,400	.....	460,400	82,133
Liverpool.....	103,600	.....	.....	.....
Scotland (Glasgow).....	.....	.....	11,066	.....
France (Marseilles).....	64,933	.....	.....	56,400
Russia (Vladivostok).....	51,600	.....	.....	.....
Totals.....	2,734,533	.....	471,466	138,533

NORTH AMERICA:	.....	.....	.....	.....
United States—	.....	.....	.....	.....
New York.....	53,000	8,800	112,000	508,533
Seattle.....	1,987,066	.....	.....	449,066
Akron.....	1,435,600	.....	.....	26,933
San Francisco.....	276,000	.....	.....	126,600
Boston.....	8,933	.....	.....	.....
Canada (Ontario).....	32,600	.....	.....	.....
Totals.....	7,639,735	8,800	112,000	1,200,532

Grand Total.....	10,374,268	8,800	583,466	1,339,065
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* 1,038,800 pounds transhipped.
+ 208,400 pounds transhipped.
- 273,333 pounds transhipped.

GUTTA PERCHA, TO—	.....	.....	.....	.....
Singapore.....	58,16	21,384	1,382,955	678,269
GUTTA JELUTONG, TO—	.....	.....	.....	.....
Singapore.....	.....	.....	.....	1,584
Australia.....	.....	.....	.....	24,200
Totals.....	.....	.....	.....	24,200

STOCKS OF RUBBER.

Spiders in United States

		Central America.	East Indies and Africa.	Stock, Europe, Fara Grades.	All Grades, Europe, Exclusive of Plantations.
Dec. 31, 1910	169	581	515	3,090	6,422
Dec. 31, 1911	319	183	134	1,530	3,370
Dec. 31, 1912	201	248	156	605	1,713
Dec. 31, 1913	97	142	156	395	2,925
Dec. 31, 1914	94	113	141	269	738
Dec. 31, 1915	273	43	340	269	481

*Including Canada and Bermuda.

Stock Para Grades in Para and Africa, 2040 tons

Total Stocks,
All Grades,
Europe,
Exclusive of
Plantations.

6,422
3,370
1,713
2,925
738
481

YEARLY EXPORTS AND IMPORTS OF CRUDE AND
MANUFACTURED RUBBER.

EXPORTS.

CRUDE RUBBER.

	1914		1915	
	Pounds.	Value.	Pounds.	Value.
Sumatra, Borneo	1,155,840	.....	1,892,000	.....
To Holland	2,051,840	.....	7,188,680	.....
England	11,800	.....	.....	.....
Germany	15,680	.....	.....	.....
Italy .....	.....	.....	.....	.....
.....	2,791,040	.....	22,400	.....
.....	790,720	.....	.....	.....
United States	1,621,760	.....	257,600	.....
.....	67,200	.....	4,071,560	.....
Totals	7,714,560	.....	14,148,960	.....
Great Britain .....	.....	.....	.....	.....
From Hull .....	.....	.....	.....	.....
.....
.....
.....
Totals to U. S. .....	.....	.....	.....	.....

1980					
U. S. Total		\$581,036		\$1,585,727	
Strategic Settlements					
U. S. Total		\$7,747,040		\$25,043,863	
France	14,589,120	\$7,743,000	5,230,400	2,776,090	
Poland	10,035,400	3,221,063	12,277,640	4,521,032	
Malaya				4,087,916	

RUBBER MANUFACTURES

	1964		1965	
Great Britain	Pounds	Value	Pounds	Value
Foreign Programme	\$2,751	.....	\$1,264
Unallocated	37,764	.....	37,760
Totals (to U.S.A.)	\$40,515	.....	\$44,593
France				
Total Programme	\$4,283,000
Italy	2,250,000
Spain	935,000
Algeria	\$1,200,000
Totals	\$7,878,000
Final Total Expenditure	13,621,440	\$16,395,000	11,141,760	\$17,878,000

BALATA.

	1913		1914	
	Pounds.	Value.	Pounds.	Value.
...	...	\$ 100,368	...	\$679,568

GUTTA JELUTONG.

	1914		1915	
	Pounds.	Value.	Pounds.	Value.
Straits Settlements—				
To United States		\$965,271		\$1,302,005

GUTTA PERCHA.

Straits Settlements—				
To United States .....	.....	\$112,677	.....	\$82,910
		RECLAIMED.		

RECLAIMED.

Russia (Odessa)—		
To United States.....	\$104,281	
	SCRAP.	
N. Y. Z. & W. H. H. Co.		

IMPORTS

CRUDE RUBBER

		1914		1915	
		Pounds.	Value.	Pounds.	Value.
Ceylon—					
	From Straits Settlements.	2,921,953	.....	2,527,547	.....
	India	185,000	.....	1,164,293	.....
	European and other	41,000	.....	10,663	.....
	Subtotal	3,147,953	.....	3,702,503	.....
France—					
	From United States...	.....	.....	847,000	.....
	Great Britain .....	.....	.....	10,352,000	.....
	Spain .....	.....	.....	9,000	.....
	Totals .....	.....	.....	\$10,810,000	.....
United States—					
	From Ceylon .....	.....	.....	29,787,500	.....
	From European .....	.....	.....	815,800	.....
	From Russia .....	.....	.....	.....	.....

RUBBER MANUFACTURES

	1914		1915	
	Pounds.	Value.	Pounds.	Value.
France	\$1,323,000
Great Britain	3,021,000
United States
Other countries
Total	\$4,344,000
France	84,970,000	.....	84,970,000
United States	281,305	.....	281,305
Other countries
Total	85,251,305	.....	85,251,305
CHINA.				
United States—				
From America	2,197,000	.....
From China	2,181,000	.....
British Hongkong	1,139,000	.....
Other countries	952,000	.....
Cent. Am. States	26,000	.....
Other countries	5,000
Total	6,500,000

SCRAP.

United States	19,118,966	\$1,356,750	1,344,117	\$877,026
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Chicle is not produced in Canada, but large quantities from other British possessions are imported and handled through the Dominion.

EXPORTS OF INDIA RUBBER FROM MANAOS DURING FEBRUARY, 1916.

NEW YORK.

EXPORTERS.		Fine.	Medium.	Coarse.	Catchall.
Suter & Co.,	Adas	78,493	6,788	58,446	75,333
Pralow & Co.,		127,943	28,745	67,412	75,333
Armstrong & Andersen	Brasil	140,418	13,841	47,604	26,669
Arthur Robb & Co.,		100,000	8,000	60,000	60,000
I. G. Araujo		93,014	8,292	51,024	60,000
Tancredi Porto & Co.,		76,779	6,933	50,883	60,000
W. J. Brown & Co.,		90,000	3,688	50,000	76,000
Motta & Co.,					
P. Davis & Co.,		1,076	1,386		
W. & J. Davis					
Semper & Co.,		8,266	1,612	3,011	
W. & J. Davis					
Murais, Carneiro & Co.,		7,000	7,000	3,757	1,311
Amesbury		1,000			
Stowell & Son		800	320	3,680	3,757
Stowell & Son				688	
Somerville		4,028	563	1,992	2,477
Totals, February, 1916.		546,005	82,778	191,587	265,000

EUROPE.

	Price	Me-ban	Caneho	Totals	Grand Totals
1944-45	15,340	1,726	36,120	53,186	214,155
1945-46	66,738	6,742	31,387	104,867	451,670
1946-47	23,653			23,653	232,623
1947-48	22,553	4,810	1	27,364	10,880
1948-49	14,720	1,917	3,850	19,487	122,063
1949-50	13,226	4,336	7,462	25,024	81,978
1950-51	5,140	1,065	1,065	7,270	36,931
1951-52	14,320	1,000	2,254	17,574	24,044
1952-53	8,352			8,352	14,578
1953-54	1,600		1,17	1,600	14,299
1954-55	3,459		3,607	10,273	14,012
1955-56					10,273
1956-57					7,987
1957-58	532	69	45	6,363	7,870
1958-59	160		6,040	1,440	10,845
1959-60	164,300	27,819	56,344	248,463	1,835,441

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF RUBBER AND RUBBER MANUFACTURES.

ARTICLES	January, 1916.		Seven Months Ending January, 1916.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—				
Balata	261,764	\$96,432	1,555,171	\$592,907
Guayule gum	1,05,557	34,140	1,604,789	528,493
Gutta percha	1,896,402	81,108	15,030,340	644,185
Gutta jelutong	164,473	16,831	1,420,914	154,759
Totals	2,448,196	\$228,516	19,611,214	\$1,920,344

India rubber:

From France			156,864	\$75,223
Portugal	114,948	\$6,014	1,708,611	623,400
United Kingdom	5,084,899	3,724,017	42,186,534	24,960,492
Central America				
British Honduras	124,875	59,550	677,485	300,159
Mexico	25,074	11,060	1,290,338	459,568
Brazil	4,714,898	2,422,751	28,900,347	11,690,080
Other South America	766,108	367,331	3,899,279	1,694,303
East Indies	10,328,712	5,554,544	58,574,655	31,119,327
Other countries	173,935	110,000	406,051	246,276

Totals	21,333,146	\$12,311,267	137,789,564	\$71,168,828
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Rubber scrap	1,614,325	\$132,824	9,513,547	\$713,277
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Totals, unmanufactured	25,395,667	\$12,672,607	166,924,325	\$73,802,459
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Chicle (dustable)	386,176	\$164,244	3,969,707	\$1,419,842
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MANUFACTURED—(dustable)				
Gutta percha		\$1,008		\$5,781
India rubber		19,141		172,656

Totals, manufactured		\$20,149		\$178,437
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Substitutes—elasticon, etc.		\$4,276		\$11,363
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EXPORTS OF DOMESTIC MERCHANDISE.

	January, 1916.		Seven Months Ending January, 1916.	
MANUFACTURED—	Pounds.	Value.	Pounds.	Value.

Scrap and old rubber	479,682	\$46,500	2,659,723	\$224,209
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Reclaimed rubber	885,112	110,001	3,897,202	\$13,902
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Belt, hose and packing		290,304		1,465,511
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Rubber boots (pairs)	115,111	264,253	554,423	1,245,084
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Rubber shoes (pairs)	85,680	48,818	1,131,406	\$39,753
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Automobile tires:				
To England		633,366		5,465,447

Canada		68,752		736,894
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Mexico		33,825		128,979
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Cuba		35,574		268,638
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Australia		419,791		796,888
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Philippine Islands		25,595		167,580
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Other countries		539,428		2,190,826
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Totals		\$1,746,331		\$9,755,252
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All other tires		\$174,939		\$1,784,608
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Fountain pens (number)	15,636	11,940	89,245	86,263
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Other rubber manufactures		494,755		3,428,436
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Totals, manufactured		\$3,187,850		\$19,102,028
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EXPORTS OF FOREIGN MERCHANDISE.

	January, 1916.		Seven Months Ending January, 1916.	
UNMANUFACTURED—	Pounds.	Value.	Pounds.	Value.

Balata	7,947	\$2,982	196,087	\$78,386
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Guayule gum			18,500	7,770
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Gutta jelutong			2,773	305
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Gutta percha		\$7,600		931
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India rubber	607,509	411,612	2,469,269	1,347,892
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Scrap and refuse			9,204	734
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Totals, unmanufactured	610,456	\$414,594	2,753,473	\$1,444,438
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Chicle	24,774	\$6,301	98,906	\$28,341
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MANUFACTURED—				
Gutta percha				\$185

India rubber		\$560		7,595
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Totals, manufactured		\$560		\$7,780
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EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

	January, 1916.		Seven Months Ending January, 1916.	
	Pounds.	Value.	Pounds.	Value.

To Alaska:				
Belt, hose and packing		\$4,745		\$71,393

Boots and shoes (pairs)	2,961	\$187	39,940	\$102,053
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All other goods		1,466		19,458
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Totals		\$11,668		\$192,904
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To Hawaii:				
Belt, hose and packing		\$6,708		\$53,769

Automobile tires		71,021		311,192
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Other tires		7,025		36,333
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Other rubber goods		7,362		\$1,536
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Totals		\$92,116		\$452,630
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To Philippine Islands:

Belt, hose and packing	\$4,361	\$23,088
Boots and shoes (pairs)	19,344	14,690
Other rubber goods	33,187	105,528

Totals	\$56,888	\$333,455
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To Porto Rico:		
Belt, hose and packing	\$7,191	\$25,742

Automobile tires	30,946	213,789
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Other tires	1,285	13,695
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Other rubber goods	5,510	38,545
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Totals	\$39,932	\$291,771
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UNITED STATES IMPORTS OF RUBBER AND RUBBER MANUFACTURES FOR QUARTER ENDING SEPTEMBER 30, 1915.

	July 1 to Sept. 30, 1915.	
	Pounds.	Value.

UNMANUFACTURED—(free):		
Balata, crude	571,291	\$227,864

Guayule gum	1,378,854	396,406
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Gutta jelutong	7,777,902	337,305
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Gutta percha, crude	7,20,821	80,438
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Crude india rubber	55,393,384	27,330,562
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Scrap rubber	3,787,779	225,290
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Reclaimed rubber	576,497	91,301
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Totals	70,206,528	\$29,089,166
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MANUFACTURED—(dustable):		
Gutta percha	10 per cent	\$3,272

India rubber	10 per cent	115,829
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Druggists' sundries of rubber	15 per cent	5,464
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Hard rubber	25 per cent	7,952
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Rubber sponges	15 per cent	1,837
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Substitutes, elasticon, etc.	15 per cent	2,867
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Totals		\$137,221
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Chicle: Crude		\$52,018
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Refined		\$44,441
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Totals		\$96,459
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Totals		\$292,284
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RUBBER STATISTICS FOR CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	January, 1916.		Ten Months Ending January, 1916.	
UNMANUFACTURED—(free):	Pounds.	Value.	Pounds.	Value.

Rubber and gutta percha, crude				
caoutchouc or india rubber:				
From Great Britain	353,296	\$246,863	4,046,261	\$2,223,638

United States	619,586	395,264	3,618,324	1,907,407
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Brit. Straits Settlement			22,574	11,659
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Other countries	35,267	12,376	232,043	106,318
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Totals	1,008,119	\$645,366	7,919,204	\$4,249,022
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Rubber, re-covered:				
From Great Britain			4,392	\$2,482

United States	553,934	\$78,679	3,925,905	\$50,684
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Totals	553,934	\$78,679	3,930,297	\$507,166
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Hard rubber, in sheets and rods:				
From Great Britain	58	\$64	2,302	\$1,404

United States	28,343	3,264	154,946	17,731
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Totals	28,401	\$3,328	157,248	\$19,135
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Rubber substitute:				
From Great Britain			16,644	\$1,812

United States	61,894	\$4,060	431,676	\$51,194
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Totals	61,894	\$4,060	468,314	\$37,006
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Rubber, powdered, and rubber or gutta percha waste:				
From Great Britain			7,314	\$579

United States	146,678	\$7,510	1,007,382	\$60,994
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Other countries	3,120	96	15,514	630
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Totals	149,798	\$7,612	1,030,210	\$62,113
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Rubber thread, not covered:				
From United States	2,43	\$3,388	25,739	\$35,300

Balata, crude:				
From United States			1,644	\$991

Chicle, crude:				
From Great Britain			2,888	\$1,675

United States	11,180	\$3,354	22,151	\$9,952
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British Honduras	132,539	\$0,245	965,526	\$56,818
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Mexico	89,449	\$3,133	305,929	\$11,023
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Totals	233,158	\$86,732	1,516,494	\$564,427
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	January, 1916.		Ten Months Ending January, 1916.	
MANUFACTURED—(dustable):	General Tariff Value.	Preferential Tariff Value.	General Tariff Value.	Preferential Tariff Value.

Waterproof clothing:				
From Great Britain		\$8,089	\$3,454	\$282,974

United States	\$9,854		63	
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Other countries				
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Totals	\$9,854	\$8,089	\$93,469	\$282,974
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	January, 1916.	Ten Months Ending January, 1916.	Preferential Tariff Value.	General Tariff Value.
MANUFACTURED RUBBER—	General Tariff Value.	General Tariff Value.	Preferential Tariff Value.	General Tariff Value.
Hose, lined with rubber:				
From Great Britain	\$109	\$1,136	\$109	\$1,136
United States	\$7,766	\$61,136		
Totals	\$7,875	\$62,272	\$109	\$1,136
Mats and matting:				
From Great Britain	\$1,194	\$2,207		\$121
United States				
Totals	\$1,194	\$2,207		\$121
Packing:				
From Great Britain	\$91	\$201	\$1,199	
United States	4,734	41,527		
Totals	\$4,825	\$41,728	\$1,199	
Tires of rubber for all vehicles:				
From Great Britain	\$975	\$14,102	\$22,882	
United States	\$83,479	1,123,162		
France		16,437		
Other countries	685	1,817		
Totals	\$84,164	\$975,155,518	\$22,882	
*Rubber cement and all manufac-				
tures of india rubber and				
gutta percha, N. O. P.:				
From Great Britain	\$31	\$2,416	\$132,953	
United States	4,995	47,142		
Other countries		685		
Totals	\$49,126	\$12,867	\$477,246	\$132,953
Hard rubber in tubes:				
From United States	\$384	\$3,196		
Boots and shoes:				
From Great Britain			\$11,546	
United States	\$5,755	\$73,168		
Other countries		10		
Totals	\$5,755	\$73,178	\$11,546	
Beltting:				
From Great Britain	\$119	\$1,172		
United States	\$3,835	\$42,962		
Totals	\$3,835	\$119	\$42,962	\$1,172
Webbing—over one inch wide:				
From Great Britain	\$11	\$78	\$11,505	
United States	20,320	138,309		
Other countries		33		
Totals	\$20,331	\$894	\$138,371	\$11,505

*In addition the imports of rubber cement and all manufactures of india rubber and gutta percha not otherwise provided for amounted to \$251 from various countries for January, and \$897 from Great Britain and \$2,046 from various countries for the ten months ending January, 1916, the values being at treaty rates.

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	January, 1916.	Ten Months Ending January, 1916.	Prod. Re-exports of foreign goods.	Prod. Re-exports of foreign goods.
MANUFACTURED, DUTYABLE—	Prod. of Canada.	Re-exports of foreign goods.	Prod. of Canada.	Re-exports of foreign goods.
Beltting:				
To Great Britain	\$150	\$58		
United States	424			
Newfoundland	\$888	1,000		
Other countries		33		
Totals	\$888	\$1,607	\$58	
Hose:				
To Great Britain	\$3,017	\$14,625	\$201	
United States	30	3,976		
Newfoundland	267	3,233		
Other countries	5,464	11,304		
Totals	\$12,728	\$33,138	\$201	
Boots and shoes:				
To Great Britain	\$162,981	\$580,289	\$492	
United States		72,602		
Newfoundland	2,813	26,774		
Australia	1,457	26,774		
Other countries	4,041	23,235	327	
Totals	\$172,332	\$706,431	\$819	
Mats and matting:				
To Great Britain	\$1,254	\$1,154		
United States	31	404		
Other countries				
Totals	\$1,285	\$1,718		
Clothing:				
To Great Britain		\$27	\$10	
United States		39	202	
Newfoundland		140		
Other countries		72		
Totals		\$268	\$212	
*Rubber waste:				
To Great Britain	\$6,368	\$6,368		
United States	62,195	475,089	\$1,964	
Totals	\$68,563	\$481,457	\$1,964	

All other mfrs. N. O. P.:

To Great Britain	\$1,450	\$8	\$74,500	\$37,744
United States	4,850	1,000	1,000	2,800
Newfoundland				
Other countries	1,000	1,000	1,000	1,000
Totals	\$7,300	\$1,000	\$76,500	\$41,544
Waste and reclaimed rubber:				
To Great Britain	\$1,000	\$1,000	\$1,000	\$1,000
United States			640,251	\$112,840
Other countries			42,216	1,107
Totals	\$1,000	\$1,000	\$642,267	\$113,947

*During January, 60,600 pounds of rubber waste was exported to Great Britain, being the total amount shipped for the ten months ending January, 1916; also 862,100 pounds was exported to the United States during the month of January, making a total of 7,490,200 pounds for the ten months ending January, 1916.

†During January, 201,593 pounds of gum chiclé was exported to the United States. During the ten months ending January, 1916, 20,000 pounds was exported to Great Britain, 1,169,763 pounds to the United States, and 64,620 pounds to various countries.

UNITED KINGDOM RUBBER STATISTICS FOR MONTH ENDING MARCH 31, 1916.

	March, 1916.	Three Months Ending March, 1916.
IMPORTS.	Pounds.	Value.
UNMANUFACTURED	Pounds.	Value.
Gutta percha	475,800	\$384,834
From Dutch East Indies	447,900	\$1,490,400
French West Africa	227,181	634,900
Gold Coast	153,400	325,513
Other countries in Africa	49,527	331,200
Brazil	953,700	\$47,908
India	35,500	889,800
British India	2,518,300	1,691,280
Strait Settlements and dependencies, including Malacca	392,800	285,637
Malaya	6,888,000	4,763,918
Colon and dependent territories	2,164,200	1,428,019
Other countries	253,000	167,272
Totals	16,286,000	\$11,647,196
Waste and reclaimed rubber:		
Gutta percha	863,000	\$38,483
Totals	16,286,000	\$11,647,196
MANUFACTURED		
Apparel, waterproofed	17,220	197,957
Boots and shoes—dozen pairs	106,525	60,506
Insulated wire	1,215,782	145,535
Submarine cables	25,039	2,367
Automobile tires and tubes	31,380	3,729,136
Motorcycle tires and tubes	2,449	90,566
Cycle tires and tubes		1,492,400
Tires not specified		14,755

	March, 1916.	Three Months Ending March, 1916.
EXPORTS.	Pounds.	Value.
MANUFACTURED	Pounds.	Value.
Apparel, waterproofed	\$26,350	\$91,808
Boots and shoes	15,974	36,882
British South Africa	10,760	17,374
Australia	28,557	83,567
New Zealand	22,421	67,998
Canada	20,380	44,500
Other countries	88,087	220,138
Totals	\$212,635	\$562,447
Waste and reclaimed rubber:		
Gutta percha	7,074	\$36,076
Insulated wire	199,134	341,992
Submarine cables	1,129,956	338,556
Automobile tires and tubes	366,565	1,129,956
Motorcycle tires and tubes	34,870	95,487
Cycle tires and tubes	219,448	712,291
Tires not specified	67,408	202,278
Manufactures not specified	619,699	1,679,563

EXPORTS—FOREIGN AND COLONIAL.

	March, 1916.	Three Months Ending March, 1916.
UNMANUFACTURED	Pounds.	Value.
Gutta percha	1,397,800	\$987,599
From Dutch East Indies	1,676,400	1,277,036
United States	3,522,193	5,109,600
Other countries	1,185,500	1,345,530
Totals	9,434,400	\$7,132,178
Waste and reclaimed rubber:		
Gutta percha	104,900	\$17,729
Totals	40,900	10,959
MANUFACTURED	Pounds.	Value.
Apparel, waterproofed	3,730	21,141
Boots and shoes—dozen pairs	4,422	10,572
Insulated wire	338,620	61,267
Automobile tires and tubes	3,164	386,000
Motorcycle tires and tubes	1,963	9,663
Cycle tires and tubes		58,315
Tires not specified		2,940

THE RUBBER SCRAP MARKET.

NEW YORK.

THE break in the shoe market that had been confidently predicted, occurred during the first week in April, and boots and shoes declined to 9@9½ cents. Auto tires, while not so badly affected as boots and shoes, were influenced by the downward movement, and mixed tires sold to the mills for 6½ cents delivered. G. & G. tires brought 8½ to 8½ cents. The other tire sorts failed to be of interest even at easier prices, while No. 1 inner tubes at 29 cents were neglected through anticipation of lower prices. The mechanical grades all exhibited easy tendencies due to the small demand occasioned by general tone of the market. This general weakness and subsequent decline of prices in all grades is due to the similar condition of crude rubber that is always a prime factor in scrap conditions.

Spring collections are very much heavier this year, a circumstance to be expected when the enormous consumption of rubber is considered. These large accumulations of scrap naturally have a depressing influence on price values.

On April 22 sales of shoes were made at 8½ cents delivered, although some mills frankly held out for 8½ cents. The actual amount of business doing was not large, according to reliable reports, and this view is substantiated by the prevailing quietness. The tire situation is still weaker as the month draws to a close, and mixed auto tires were quoted at 6½ cents delivered, though actual sales could not be consummated at more than 6½ cents. Some G. & G. tires were going at 8½ cents, but a shade better was offered by the mills. Inner tubes were easier with No. 1 grades, selling at 28 cents delivered. Mechanical grades were weak, particularly hose, the garden variety bringing \$1.40 delivered to the mill. Air brake hose appeared to be in good demand, but prices were lower than a fortnight ago.

NEW YORK QUOTATIONS FOR CARLOAD LOTS DELIVERED

APRIL 28, 1916.

Prices subject to change without notice.

	Per Pound.
Boots and shoes.....	\$0.0875 @ 0.09
Trimmed articles.....	.06 @ .07
White tires, toweling and Goiden.....	.0875 @ .0875
Auto tires, standard white.....	.06 @ .0633
standard mixed.....	.06 @ .0633
striped, unguaranteed.....	.04 @ .0475
Auto peelings, No. 1.....	.09 @ .10
Inner tubes, No. 1.....	.28 @ .29
No. 2.....	.12 @ .13
No. 3.....	.12 @ .13
Tray tires.....	.02 @ .025
Bicycle tires.....	.04 @ .045
Solid tires.....	.05 @ .052
White scrap, No. 1.....	.14 @ .15
No. 2.....	.10 @ .11
Red scrap, No. 1.....	.10 @ .11
No. 2.....	.08 @ .09
Mixed black scrap, No. 1.....	.04 @ .045
No. 2.....	.02 @ .025
Rubber car springs.....	.04 @ .05
Truck shoe pairs.....	.04 @ .045
Mattings and packings.....	.01 @ .015
Garden hose.....	.01 @ .015
Air brake hose.....	.05 @ .055
Auto air hose.....	.04 @ .045
Lane hose.....	.01 @ .015
Hard rubber scrap, No. 1, bright fracture.....	.25 @ .26
Battery cars (black).....	.03 @ .035
Insulated wire stripping.....	.03 @ .035
Rubber heels.....	.03 @ .035

MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

EGYPTIAN COTTON.

THE Alexandria market developed weakness about the middle of March and prices steadily declined, showing a loss of about ½ cent on the old crop cotton. This reaction is apparently of local origin, as the American markets were generally well sustained. Prices for new crop futures have been averaging about 2 cents less than those for the old crop for some time. The statistical local position continues to grow stronger daily, stocks are decreasing, and the interior is now practically cleared of cotton. It must not be forgotten that before getting new cotton, five months' requirements are to be filled, and the present stocks at Alexandria are insignificant.

SEA ISLAND COTTON.

The southern markets have been quiet for the past month, and prices show very little change as compared to the figures of a month ago. The entire crop has been disposed of, and is now in second hands, consequently the southern markets are closed until the next crop comes in. On April 21 there were 67,903 bales in sight at all ports, compared to 63,754 at the same date last year.

FABRICS.

Great Britain's cotton fabric embargo, that went into effect last month, was the result of England's desire to facilitate the shipment of war orders. Permits must be obtained from the British Consul for all shipments of cotton fabrics, and those classed as necessities are given preference over all others. This new order went into effect without disturbing the market.

Tire fabrics are still high, and deliveries on contracts are usually delayed. Supplies are used up so rapidly that the rubber mills are unable to maintain any stocks of tire fabric, whatever. There has been no change in the market during the month, and prices are firm.

COTTON DUCK.

Trade conditions are prosperous and the demand is good for hose and mechanical duck, in fact, deliveries are only restricted by the question of securing raw materials promptly. Goods are going into consumption as soon as they are shipped. Auto top manufacturers are buying for 1917 deliveries.

Most of the ducks, drills, sheeting, etc., used by the rubber trade are sold up to the end of the year. Indeed, many contracts have already been written, covering the first six months of 1917 and options are called for on deliveries, during the last half of the coming year. The demand seems to be increasing, and prices have advanced in a firm market. There is little doubt that the recent advance in wages paid the textile workers in New England will become general throughout the East. American textile workers will then enjoy the distinction of being the highest paid labor in the textile world. That the direct cause of this increase is entirely due to the high wages paid by manufacturers of munitions, there is no doubt, and it is equally true that when normal conditions once more prevail, wages will be revised.

NEW YORK QUOTATIONS.

APRIL 28, 1916.

Prices subject to change without notice.

Aeroplane and Balloon Fabrics:	
Wamsutter, S. A. I., No. 1, 40-inch.....	yard \$0.22 @
No. 4, 38½-inch.....	.22 @
O/X B, 36-inch.....	.12 @
Wood Stockinettes—52-inch:	
A—14-ounce.....	yard 1.12 @
B—14-ounce.....	1.25 @
C—14-ounce.....	1.50 @
Cotton Stockinettes—52-inch:	
D—14-ounce.....	yard .49 @ .50
E—11½-ounce.....	.39 @ .40
F—8-ounce.....	.53 @ .54
G—8-ounce.....	.43 @ .44
H—11-ounce.....	.48 @ .49
I—9-ounce.....	.40 @ .41
Colors—white, black, blue, brown.	

Tire Fabrics:	
17½-ounce Sea Island, combed.....	square yard .75 @ .78
17½-ounce Egyptian, combed.....	.70 @
17½-ounce Egyptian, carded.....	.67 @
17½-ounce Peeler, carded.....	.46 @
Sheeting:	
40-inch 2.53-yard.....	yard .10 @
40-inch 2.50-yard.....	.10 @
40-inch 2.70-yard.....	.09 @
40-inch 2.85-yard.....	.08 @
40-inch 3.15-yard.....	.08 @
Osaburgs:	
40-inch 2.25-yard.....	yard .11 @
40-inch 2.48-yard.....	.10 @
37½-in. 2.42-yard.....	.10 @
Mechanical Ducks:	
Belting.....	pound .27 @ .28
Carriage Cloth Duck:	
38-inch 2.00-yard enamel duck.....	yard .13 @
38-inch 1.75-yard.....	.15 @
38-inch 1.66-yard.....	.13 @
72-inch 17.21-ounce.....	.34 @
Drills:	
40-inch 2.90-yard.....	yard .13 @
40-inch 2.47-yard.....	.11 @
52-inch 1.90-yard.....	.14 @
52-inch 1.95-yard.....	.14 @
60-inch 1.52-yard.....	.19 @

Acetone (drums) 1, 2, 4 bbls.	found	\$8.28	@	.30
First class 12 1/2 bbls.		.27	@	.50
Imported Woollen Fabrics Specially Prepared for Rubbering—Plain and Fancies:				
63 mesh, 3 1/2 to 4 ounces	square yard	.85	@	1.55
36 mesh, 2 1/2 to 3 ounces		.35	@	.85
Imported Plaid Lining (Union and Cotton):				
63 mesh, 3 1/2 to 4 ounces	square yard	.45	@	.75
36 mesh, 2 1/2 to 3 ounces		.25	@	.55
Domestic Woollen Fabrics:				
63 mesh, 3 1/2 to 4 ounces	square yard	.75	@	.45
Domestic Woven Plain Linings (Cotton):				
36 mesh, 3 1/2 to 4 ounces	square yard	.15	@	.20
Raincoat Cloth (Cotton):				
63 mesh, 3 1/2 to 4 ounces	yard	.06	@	.10
Twills		.10	@	.15
Tweed		.20	@	.35
Tweed, printed		.20	@	.35
Plaid		.06	@	.10
Repp		.18	@	.25
Burlaps:				
32-7 1/2-ounce	100 yards	none		
40-7 1/2-ounce		7.50	@	
40-10-ounce		7.60	@	
40-10-ounce		10.00	@	
40-10 1/2-ounce		10.15	@	
45-7 1/2-ounce		8.85	@	
45-8-ounce		9.00	@	
48-10-ounce		14.75	@	

THE MARKET FOR CHEMICALS AND COMPOUND-INGREDIENTS.

PRICE changes during the month have not been important and most materials have been held at previously quoted levels. This is true of litharge, white lead, orange mineral, zinc oxide, lampblack, china clay, lithopone and whiting. High prices and scarcity of some materials have contributed to retard jobbing activity.

Barytes has sold at advanced prices and the market is strengthened not only by good consuming demand, but also by increased cost of production.

The movement of prices for spirits of turpentine was downward during the last week of the month. There has been no apparent realization of the expected spring inquiry so far, and primary values are said to have settled to a lower than cost basis.

In the case of caustic soda the undertone of the spot market continues heavy, on account of the amount of resale stock held by second hands. The inability to secure ocean tonnage has resulted in moderate accumulations, and sellers are experiencing some difficulty in moving goods into consuming channels.

NEW YORK QUOTATIONS, APRIL 28, 1916.

(Subject to change without notice.)

Acetone (drums)	lb.	50.40	@	
Acid, acetic, 28 per cent. (bbls.)	lb.	.07 1/2 @	\$0.08	
Acrylic (crude)	gal.	.80	@	.50
Glacial, 90% (carboxy)	lb.	.50	@	
Muriatic, 20"	lb.	.03 1/2 @		
Nitric, 36"	lb.	.06 1/2 @		
Sulphuric, 60"	lb.	.02 1/2 @	\$0.25	
Alumina Pigment, No. 1 (sacks and bbls.)	ton	14.00	@	19.00
Aluminum Flake (carboids)	ton	22.00	@	
Ammonium carbonate	ton	.09 1/2 @		
Antimony, crimson, sulphuret of (sacks)	lb.	.80	@	.90
crimson, "Mephisto" (sacks)	lb.	.85	@	
golden, sulphuret of (sacks)	lb.	1.25	@	
golden, sulphuret, States brand, 16-17%	lb.	.65	@	
Asbestos	ton	19.50	@	21.00
Asphaltum "G" Brilliant	ton	.02	@	
Barium sulphate, precipitated	ton	None		
Barytes, pure white	ton	50.00	@	65.00
off color	ton	20.00	@	23.00
Basofo	ton	140.00	@	
Benzol, pure	gal.	.80	@	
Beta-Naphthol	lb.	1.25	@	
Black Hvyo	lb.	.30	@	.40
Bone ash	lb.	.03 1/2 @		
Cadmium tri-sulphate	ton	None		
yellow	ton	27.12	@	35
Cellulosa gum	lb.	.08 1/2 @		
Carbon, bisulphide (drums)	lb.	.30	@	
black (cases)	lb.	.30	@	
tetrachloride (drums)	lb.	.25	@	
Charcoal, 70 mesh	ton	.05 1/2 @		
Chalk, precipitated, extra light	ton	.06	@	
precipitated, heavy	ton	.04	@	
China clay, domestic	ton	10.00	@	11.00
imported	ton	10.00	@	
Chrysine, green	lb.	.35	@	.45
yellow	lb.	.35	@	.45
Coal tar	bbl.	4.50	@	
Cotton oil, refined	lb.	.10	@	
Cotton linters	lb.	.08 1/2 @		

Crack black	ton	.22	@	
Crack white	ton	40.00	@	
Glycerine, C. P. (drums)	lb.	.60	@	
Graphite, flake (400 pound bbl.)	lb.	.20	@	
powdered (400 pound bbl.)	lb.	.65	@	
Green oxide of chromium (casks)	lb.	.75	@	
Ground glass	lb.	.02 1/2 @		
Indian red, reduced grades (casks)	lb.	.08	@	
pure (Cask lots)	lb.	.06 1/2 @	.10	
Infusorial earth, powdered	ton	60.00	@	
Iron oxide, red, reduced grades	lb.	.02 1/2 @	.03	
red, pure, bright	lb.	.08 1/2 @		
Hemoglobins	lb.	.08	@	
Ivory, black	lb.	.10	@	.24
Lampblack	lb.	.12	@	.18
Lead, red	lb.	.09 1/2 @		
sublimed blue	lb.	.08 1/2 @		
white, basic carbonate	lb.	.08 1/2 @		
white, basic sulphate	lb.	.08 1/2 @		
Lime, flour	lb.	.01 1/2 @	.01 1/2	
Litharge	lb.	.09 1/2 @		
Lithopone, domestic	lb.	.16	@	
imported	lb.	.15 1/2 @	.16	
Magnesia, carbonate	lb.	.40	@	.45
calcined, heavy	lb.	.10	@	.50
light	lb.	.45	@	.50
Magnesite, calcined, refined	15.00	@	39.00	
Mica, powdered	lb.	.03 1/2 @	.05	
Mineral rubber	lb.	.01 1/2 @	.03	
Naphtha, store gasoline (steel bbls.)	gal.	.24	@	
66/68 degrees	gal.	.28	@	
67/70 degrees	gal.	.29	@	
Y. M. & P.	gal.	.30	@	
Oil, aniline	lb.	.85	@	1.25
linseed (bbl.)	gal.	.27	@	.80
palm	gal.	.17	@	.20
paraffin	gal.	.17	@	.20
pine (cases)	gal.	.60	@	
rapeseed	gal.	1.05	@	1.15
rosin, heavy body	gal.	.18	@	
tar (cases)	gal.	.18	@	
soluble aniline colors, yellow, orange, red, violet,	lb.	3.50	@	5.00
Orange mineral, domestic	lb.	1.25	@	
Paragol	lb.	.10	@	
Petroleum	lb.	.04	@	.04
Petroleum grease	lb.	.02 1/2 @	.04	
Pine solvent	lb.	6.50	@	
Pine tar	lb.	.04	@	.05
Plaster of paris	lb.	.01 1/2 @		
Prussian blue	lb.	2.50	@	1.70
Pumice stone, powdered (bbls.)	lb.	.02	@	.03
Resin, Pontianak, refined	lb.	.18	@	
rotten stone, ground	lb.	.13	@	.14
fused	lb.	.12	@	.13
Rosin (280 pound bbls.)	bbl.	4.85	@	8.50
Rotten stone, ground	lb.	.04 1/2 @		
Rubber black	lb.	.03	@	
Rubber compound, Richmond brand	lb.	.03	@	
No. 64 brand	lb.	35.00	@	
Rubber substitute, black	lb.	.08	@	.13
white	lb.	.12 1/2 @	.18	
blue, green	lb.	.28	@	
Rubhide	lb.	.12 1/2 @	.18	
Shellac, fine orange	lb.	.30	@	.32
Soapstone, powdered	ton	9.50	@	15.00
Starch, corn, powdered	lb.	.03 1/2 @		
Sulphur chloride (drums)	lb.	.09	@	
Sulphur, flour, velvet, Brooklyn brand (cask lots)	gal.	2.15	@	
Talc, American	ton	8.50	@	15.00
French	ton	22.50	@	35.00
Toluol, pure	gal.	4.75	@	5.00
Triplite earth, powdered	lb.	.02 1/2 @	.03	
boiled	lb.	None		
Turpentine, pure gum spirits	gal.	.48 1/2 @	.49	
wool	gal.	.50	@	
Venise	gal.	.10	@	.50
Ultramarine blue	lb.	.10	@	.50
Vermilion, brilliant	lb.	1.50	@	1.25
Chinese	lb.	.80	@	.75
English	lb.	.75	@	.70
Wax, bayberry	lb.	.20	@	.25
beeswax, white	lb.	.10	@	.15
ceresin, white	lb.	.10	@	.15
caruba	lb.	.25	@	.40
ozokerite, black	lb.	.65	@	.85
green	lb.	.65	@	.85
montan	lb.	.30	@	.35
paraffin, refined	128/120 m. p. (cases)	.05 1/2 @	.06	
128/126 m. p. (cases)	lb.	.06	@	.07
128/130 m. p. (cases)	lb.	.06 1/2 @		
132/136 m. p. (cases)	lb.	.07	@	.09
crude white, 117/119 m. p. (bbls.)	lb.	.04	@	
yellow, 124/126 m. p. (bbls.)	lb.	.04 1/2 @		
Whiting, Alba	ton	50	@	80
commercial	ton	60	@	.65
gliders	ton	70	@	.75
Paris, white, American	ton	85	@	90
English chistone	ton	70	@	75
Wood pulp XXX (carboids)	ton	70	@	00
Yellow ochre (Satin) process, horseshoe brand	lb.	.03	@	
Special	lb.	.11 1/2 @		
"XX red"	lb.	.10 1/2 @		
French process, green seal, f. o. b. factory	lb.	.24	@	.24
red seal, f. o. b. factory	lb.	.24	@	.24
white seal, f. o. b. factory	lb.	.30	@	.25
Zinc oxide, white seal (Carlsberg)	lb.	None		
Zinc sulphide, pure	lb.	None		



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FRENCH IMPORTS AND EXPORTS OF RUBBER AND RUBBER GOODS DURING 1915.

Articles—	Imports.		Exports.	
	Pounds.	Value.	Pounds.	Value.
Crude rubber.....	29,256,040	\$15,809,981	5,136,780	\$2,775,919
Pure non-vulcanized rubber.....	109,780	134,907	.....	.....
Vulcanized rubber sheet.....	14,740	582,281	.....	.....
Esquis. fabric.....	138,100	218,090	433,180	645,971
Rubberized fabric.....	159,280	167,917	13,390	13,703
Dress-shields.....	3,520	8,878	.....	.....
Garters, suspenders, belts.....	6,820	17,370	.....	.....
Cash-leaf.....	28,380	18,721	43,120	29,915
Rubberized garments.....	140,140	376,393	217,890	406,672
Rubber.....	2,000,000	1,260,097	83,820	46,899
Tires and motor tubes.....	790,020	1,143,525	8,729,380	17,716,837
Belt, hose and packing.....	1,564,200	1,098,684	1,466,300	1,015,288
Totals.....	34,848,660	\$20,730,844	16,123,580	\$16,350,604

*Does not include 82,740 pounds imported for the army

Clarence A. Evans, of Worcester, and Charles S. Burgess, of North Brookfield, have been appointed receivers for the B. & R. Rubber Co., of North Brookfield, Mass., under a bond of \$50,000. The company has liabilities of \$265,000, assets, \$80,000. It is understood that the receivers will operate the factory on present orders, for a month, for the purpose of determining what advantage the creditors may expect by a continuation of this policy.

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INDIA RUBBER WORLD

FOUNDED
1889

BUYERS' DIRECTORY
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OUTCHOU

HEVEA BRASILIENSIS

DICHOPIPSIS GUTTA

GUTTA-PERCHA

Reg. United Kingdom

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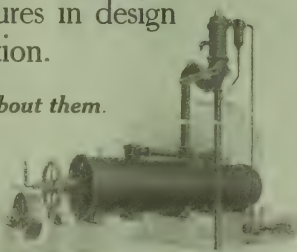


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TABLE OF CONTENTS ON LAST PAGE OF READING.**PROCESSIONAL EFFICIENCY.**

PIECE work and team work, so long the acme of processional effectiveness in great manufacturing establishments, are beginning to look antiquated when compared with processional work. At bottom its basis is simplicity itself and is of this sort. Say that in days past a blacksmith struck a piece of iron twenty blows to secure a certain result. Processionally there would be twenty blacksmiths ranged before twenty anvils. The iron brought before each pauses only long enough to be smitten once and passes to the next. The first blacksmith has just time enough to raise his hammer when another piece of iron is in place to receive its blow. A man who misses a blow promptly loses his job. Each worker must do his part at just the right moment or it gets by him. Active and alert men are required and the pay, by the day, is exceedingly high—and the amount of work accomplished is tremendous. Of course, the iron hammering description is only by way of explanation. Such work would be done by machinery. But processional

work has already been adopted in automobile manufacture, and wherever it is adaptable to rubber work it is sure to be tried out.

THE UNIVERSALITY OF THE RUBBER STAMP.

IT is not contended that the rubber stamp is quite on the same plane of importance as the rubber tire, for instance. In value of annual product these two commodities stand in about the ratio of fifty to one. The car owner's annual contribution to the rubber industry aggregates approximately \$200,000,000. That of the stamp user is about \$4,000,000.

But in one particular the stamp far surpasses the tire—in its universality. Bankers, merchants, office boys, farmers' wives, young girls with a dozen handkerchiefs, all use them. There are 12,000,000 tires in use in the United States today, while of rubber stamps there are 100,000,000. Someone may say "That's a rubber stamp for every person—man, woman and child—not to mention infants in arms." Quite true. There are not 100,000,000 stamp-owners, but over against the ten men who use none is the man who uses a four-story rack full of them.

The rubber stamp does its work faithfully and cheerfully until it is worn out in service, and dies in the harness. It has the supreme virtue of unfailing reliability—it tells the same story day after day and never deviates a hair's breadth.

In fact it has become so generally recognized as a symbol of docile, unquestioning obedience that when one statesman wants to charge another with too unfaltering loyalty to somebody else he invariably calls him a "rubber stamp."

A PESSIMISTIC PROPHECY.

A NEW YORK financial sheet recently sent to its subscribers a confidential communication, which it claimed originated with a leading bank interest in New England, that should surprise the rubber trade. The advice, which was in the nature of a warning, claimed:

First—That the production of plantation rubber had reached its maximum, due to overtapping of the trees.

Second—That a white ant pest was retarding rubber production.

Third—That reclaimed rubber could not be relied upon to take the place of crude.

Fourth—That higher prices for tires were to be expected.

An expert who does not know a tapping test from a tuning fork, a white ant from a whipparee, or reclaimed rubber from honeycomb tripe is perhaps not to be taken seriously when he talks rubber. Nevertheless, with the hope that this catches his eye, we submit the following

facts: Plantation production has not begun to approach its maximum. Not only will existing plantations show an increase next year, but hundreds of thousands of trees just coming into bearing will add to the aggregate in rubber production. In addition, thousands of small plantings by natives all through the Far East will add their product. As for white ants, they have been fought from the beginning and are not a menace, as they are well under control. Further, few trees have been overtapped, and no danger is to be feared from this source. As to reclaimed rubber, it is not "dead," but by modern processes just as live as new rubber.

One statement is perhaps correct. Tire prices, because of higher labor, more costly cotton and compounding ingredients, may advance.

We congratulate the New England banker-prophet upon scoring one point out of four—75 per cent wrong is better than the usual 100 per cent.

ASBESTOS AND ITS EMBARGO.

AN order in council by the government at Ottawa, Canada, in March of this year, placed an embargo on the shipment of asbestos from Canada to other than British ports, but permitted shipments to the allied countries, France, Russia, Italy, Japan, and Portugal, on special licenses granted by the British consul. The announcement of this order was received with alarm by users of asbestos in the United States, and a vigorous protest was at once filed. It was shown that practically 90 per cent of all the asbestos used in this country comes from Canada, and this shutting off of supplies would cripple several important industries. It was demonstrated to the government at Ottawa that a great hardship would be entailed, and the embargo has been modified to the extent of permitting shipments of crude asbestos to enter the United States if guarantees are given by the manufacturers and their customers that none of the crude or manufactured material will be re-exported, except as provided for in the original order.

For the last few years we have been importing annually from 60,000 to 76,000 tons, of a value of from \$1,378,000 to \$1,678,000, and practically all of this came from Canada, about 200 tons being imported from Europe. In no year previous to 1914, has the total domestic output amounted to 8,000 tons, while the average is less than 4,000 tons per year, and in 1913 and 1914 it was less than 1,300 tons.

Rubber manufacturers are using steadily increasing

quantities of asbestos, chiefly in packings and automobile brake lining. The latter is a narrow asbestos fabric impregnated with rubber and vulcanized. That it is an important product may be inferred from the fact that the 3,000,000 or more automobiles in this country, and the 200,000 trucks, have certainly two, usually four brake linings. The total length of such lining needed for a single car is about ten feet. This of itself would make about 37,000,000 feet—a tremendous production. And when it is considered that such linings wear out in use, and must be renewed, it will be seen how important is this one branch of the asbestos-rubber industry.

The raw material is also used for clutch lining. About 35 per cent of 1916 models of automobiles have dry disk clutches, and while the amount used for this purpose is small, compared with that used for brakes, still in the aggregate, this is, in itself, an important addition to the business.

There are, of course, other uses for asbestos in the rubber trade. All manufacturers of mechanical rubber goods use this material, chiefly in packings.

The action of the Canadian Government has brought vividly to the minds of American manufacturers their dependence upon imports of asbestos. Investigation as to the resources of our own country as reported by the United States Geological survey shows that in 1915 there was a great increase in the production of high-grade asbestos in Arizona. The lower grade asbestos produced in this country comes mainly from Georgia. Both Arizona and Georgia are capable of increasing their output. Virginia, ten years ago, produced a small quantity of low-grade asbestos and in 1911 Vermont had a productive mine, largely of the chrysotile variety, in the same belt of rocks that contain the rich deposits in Canada. For the last few years the mine has not been in operation. Asbestos has also been reported in the Casper Mountains and other regions in Wyoming and there are deposits in Idaho of about the same quality of material as that in Georgia. California has produced some low grade asbestos.

However, as far as rubber manufacturers are concerned, it is probable that they will continue to use the Canadian product, submitting to the conditions required by the Dominion Government, which are practically the same as these manufacturers have agreed to with the British Government with regard to the importation of crude rubber and the exportation of rubber manufactures.

Rubber in the Construction of Aeroplanes.

THE balloon has not received as much attention in America as in Europe. Americans have never believed that it would become really practical, and heavier-than-air machines have possessed more attraction for our inventors. The problem of mechanical flight has given birth to many chimerical plans and projects, but the fact remains that, although most of the earlier theoretical literature on the subject came from France, practical results with machines heavier than air were first obtained by Americans.

As far back as 1894, Hiram Maxim, an American residing in England, constructed a flying machine, provided with a steam engine, which showed flying capability but lacked stability. Professor Langley, secretary of the Smithsonian Institution at Washington, built several working models of flying machines propelled by steam engines, of which two, in 1890, made aerial flights of about a mile. Then followed, also in America, the remarkable "gliding" experiments of Lilienthal, Chanute, Herring and finally of the Wright brothers who, as far back as 1902, had completed gliders

possessing most of the refinements of modern aeroplanes, minus the motor. Since Wilbur Wright made his historical flight in 1908—the first mechanical flight worthy of the name—gigantic strides have been made towards perfection in navigating the atmosphere with machines heavier than air, and thousands of successful aeroplanes of many types have been produced.

The flying machine has proved its value both as a vehicle of sport and as an instrument of war. The new industry has been growing rapidly all over the world. Forty American aeroplane factories are now working full force on foreign government orders for flying machines, and consequently it seems quite worth while to go somewhat into details concerning this industry and the extent to which rubber is used in the construction of aeroplanes.

AEROPLANE CONSTRUCTION.

There are four important ways in which rubber is used in the construction and use of aeroplanes: First, in the pneumatic tires with which the wheels are equipped; second, in the rubberized fabric for covering the wings and other surfaces; third, in the construction of shock absorbers, and fourth, in the equipment of the aviator and passengers.

All aeroplanes—some water-aeroplanes excepted—are equipped with wire wheels similar to motorcycle wheels and provided with pneumatic tires which are either cemented, glued or attached with lugs to the rims of the wheels. The Dunlop type of tire is most favored for aeroplane service on account of the facilities it offers for light construction. The size of wheels and tires varies with the type of machine. Aeroplane tires must be attached very tightly to their rims, for the slipping off of a tire is even more dangerous to an aviator bringing his machine to earth

than it is to an automobilist taking a corner on the road. Aeroplane tires must have great resiliency and strength of fabric to withstand the terrific shock when an aeroplane alights on rough, uneven ground. A blow-out at such a moment might prove fatal. The plain tread is perhaps most used, although aeroplane tires are also made on the non-skid plan. The tire and the rims of the wheels of aeroplanes should be constructed so as to make rim-cuts impossible even when the landing shock flattens out the tires.

AEROPLANE FABRICS.

Fabrics play an important role in aeroplane construction. As long as the cloth covering the sustaining planes of a flying machine stays taut in all kinds of weather, little attention is paid to it, but when it alternately shrinks and stretches, when it shows itself as sensitive as a hygrometer to the presence or absence of atmospheric moisture, aviators and aeroplane constructors soon realize the importance of aeroplane cloth. The quality of the cloth affects the efficiency and even the safety of

a flying machine. Aeroplane cloth must be moisture-proof, heat-proof and cold-proof, and it must not oxidize in the sun or become affected by gasoline or engine oil.

The following fabrics are used in the construction of aeroplanes: Cotton canvas, either unbleached or colored in yellow, and weighing from 145 to 150



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AEROPLANE FLOWN DURING THE NEW YORK PREPAREDNESS PARADE, MAY 13, 1916.

grams (4.90 to 5.07 ounces) per square meter (10.764 square feet), is used single-fold for covering the sustaining surfaces of flying machines. The tensile strength of this canvas is from 2,200 to 2,800 pounds per running yard and its thickness about 0.18 millimeter (0.007 inch). Some constructors use cotton canvas weighing from 180 to 200 grams (6.34 ounces to 7.05 ounces) per square meter (10.764 square feet), having a tensile strength of about 2,600 pounds to the running yard and a thickness of about 0.18 millimeter (0.007 inch). Flax fabrics or linen are most used. Linen fabrics weigh about 145 grams (4.90 ounces) to the square meter (10.764 square feet) and their tensile strength is in the neighborhood of 3,600 pounds to the running yard or 18.80 pounds to the square millimeter (0.00155 square inch), while their thickness is around 0.20 millimeter (0.0078 inch). Silk fabrics, though stronger than others for their weight, are not used in the construction of aeroplanes on account of their excessive cost.

French constructors use quantities of ramie fabric. This weighs 120 grams (4 ounces) per square meter (10.764 square feet), its tensile strength is 2,120 pounds per running yard, or 13.64 pounds per square millimeter (0.00155 square inch), and its thickness 0.17 millimeter (0.0066 inch). Ramie fabrics are very tough and hard to tear.

MAKING THE FABRIC MOISTURE PROOF.

Rubberized fabrics were used almost exclusively for covering

the sustaining surfaces of the first aeroplanes, but the rubber industry had been taken unawares and the rubberized fabrics then obtainable were not well suited for the requirements of aeroplane construction and they soon fell in disfavor because the best of them absorbed a certain amount of humidity, stretched, and thus lost their rigidity. Canvas, coated with acetate of cellulose,



Photograph from Underwood & Underwood.

SHIPPING U. S. ARMY AEROPLANES INTO MEXICO

lose, took the place of rubberized fabrics in the construction of aeroplanes because such canvas is supple and at the same time little affected by the weather. The plain canvas was first stretched and fastened tightly to the frame of the machine and then coated with acetate of cellulose varnish. Acetate of cellulose applied in the form of a collodion tightens cloth that is stretched on a frame; it makes the cloth waterproof without making it stiff and brittle as nitrocellulose does; it does not crack and it is not inflammable. Acetate of cellulose varnishes used in the early days of aviation were diluted with chloroform, but this solvent was soon dropped on account of its high cost and the danger in its use. At the present time two sorts of acetate of cellulose varnishes are used—varnishes that give a rigid coating and those that give supple coatings.

RUBBERIZED FABRICS.

The use of rubberized fabrics in the construction of aeroplanes is not so extensive as it is generally believed to be. Aeroplane manufacturers and aeroplane users are still under the influence of the prejudice developed in the early days of aviation when proper rubberized fabrics for this purpose were not to be obtained. The fabrics available in the pioneer days of aviation were rubber-coated and not impregnated with rubber as they are now. The result was that the rubber coating cracked and peeled off, allowing moisture to penetrate the fibre of the fabrics, causing them to alternately shrink and stretch. Modern rubberized aeroplane fabrics present no such difficulties, and aeroplane builders are now beginning to give them the consideration they deserve.

Rubberized balloon fabrics are made either of linen or of cotton and they are thoroughly impregnated and saturated with rubber applied gradually by a series of operations. Manufacturers have learned to make them absolutely weather-proof and lasting. Besides being thoroughly saturated with rubber, modern rubberized aeroplane fabrics are generally coated with rubber solution on both of their surfaces. These coatings are so light that rubberized aeroplane fabrics are no longer open to objections on the score of weight, as was formerly the case. The process of preparing these fabrics is quite similar to that used in the preparation of balloon fabrics already described in a preceding article on the subject. Aeroplane fabrics are made in all colors or, like some of the balloon fabrics, are metallized with aluminum.

SHOCK ABSORBERS

All aeroplanes are provided with a running gear which invariably includes a system of shock absorbers built to protect

the machine as well as the aviator from too violent shocks when leaving and when returning to earth.

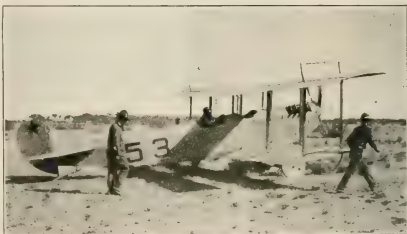
The Blériot type of rubber springs or shock absorbers was at first built up of fine rubber strands bundled together, covered with a cotton fabric, the ends of the strands being firmly held in metallic clamps constructed in such a manner as to facilitate the fastening of the spring to the landing gear of the aeroplane. It was, however, discovered that the fine rubber strands soon decayed from oxidation and their place was taken by molded rubber vulcanized to give proper tensile strength and elasticity.

The Farman type of aeroplane spring is used in attaching the axle on which the wheels are mounted, to the skids of the flying machine. Two or more rubber rings are hooked to one side of the skid, then brought over the axle and fastened to the other side of the skid. These rings are made of either red or of bluish-gray stock compounded so as to be strong enough to withstand heavy strain and with the exact degree of elasticity to allow proper elongation and no more. These types of rubber shock absorbers vary widely with the type of machine and of landing gear used. For aeroplane shock absorbers rubber is unrivalled on account of its light weight and extraordinary elasticity. Metal springs, hydro-pneumatic shock absorbers and the like are used but not nearly to the extent that rubber is.

EQUIPMENT OF THE AVIATOR.

Aviators, when flying, use rubber and rubberized fabric clothes almost exclusively. These are made in all colors and afford perfect protection against weather. Aerial waves make riding in an aeroplane comparable to riding a bucking bronco and aviators are obliged to fasten themselves to their seats lest they be thrown out by the violent bounding of their machine.

Here again rubber is used in the shape of a rubber belt which the aviator passes around his waist and fastens to the machine with leather straps. Such a belt not only prevents the aviator



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UNITED STATES MILITARY AEROPLANE IN MEXICO.

from being thrown out of his machine but, in case of accident the elasticity of the rubber acts as a fall-breaker. This type of rubber belt is generally composed of two pieces held together by a miniature coupling pin. By pulling out the coupling pin the flyer can immediately free himself from his machine.

Many aviators use hard rubber helmets to guard their heads in case of accident and rubberized gloves to protect their hands and forearms from cold and rain. As in dirigibles, the navigating instruments used in aeroplanes are generally held in place by soft, elastic rubber attachments which prevent excessive vibration and violent shocks reaching the delicate mechanism of these instruments. The upholstering of aeroplane seats is often made of rubberized fabric inflated with air. Aviation, like aërostation, presents numerous and extensive applications of rubber and offers an interesting field to the rubber manufacturer, and one that may in the future grow into much larger proportions and become of still greater importance.

The European Rubber Trade After the War.

Written by a German, well posted on general conditions of the European rubber industry, this article gives the writer's forecast of the manner in which the European rubber trade will be resumed after the war.

A VERY conservative estimate made according to the actual business done during the year 1913 shows that the total international turnover in rubber goods represented by the sum of the imports and exports from one to the other of the countries now at war was about \$40,000,000, or five-sixths of the total interstate rubber trade of Europe.

Of the rubber goods imported into Germany, amounting to approximately \$6,500,000, about \$600,000 came from France. England supplied \$2,300,000 worth, Russia \$1,000,000, Austria \$450,000 and Belgium \$250,000. Germany in return sent about \$3,500,000 worth to France; England bought for her own use and for her colonial trade, shipped via London, about \$6,500,000; Russia received somewhat less than \$2,000,000; Belgium about \$750,000; Austria \$2,500,000; Italy \$5,000,000, and Turkey \$150,000.

Taking the case of England, it appears that apart from the business done with Germany, she bought from Belgium about \$350,000 worth of rubber goods; France supplied her with \$700,000 worth and she received about \$200,000 worth from Austria. Italy is also well represented in the British market. The English figures are far from complete, giving only tires, footwear and general goods, while many others are hidden under different class headings, as, for instance, electrical goods.

Looking at the export side of the British trade exchange, it appears that Belgium received goods to a value of \$850,000; France \$2,000,000; Russia \$250,000, and Turkey about \$100,000. The trade to Italy consisted very largely of tires and raw materials.

Belgium bought from Austria goods to the value of \$50,000 and sold her three times that amount. France sold Austria \$250,000 worth of rubber goods and in return bought half that quantity, while honors were practically even between Austria and Russia, each exchanging goods worth slightly over \$120,000.

From European letters, as well as from opinions of travelers, the feeling seems to be that the war will be followed by marked changes in the character and channels of European business. It is pointed out that the relations between the two largest competitors, England and Germany, may be restrained for a considerable time. This would doubtless necessitate a complete reorganization of the whole European market, if not that of the world.

Until the beginning of the war, the German rubber industry regarded London as a large clearing house for trade passing between Germany and the British colonies. The London shippers had acted as intermediaries, and regret is expressed that the continuance of this profitable trade relationship may be endangered by the war.

There were in London many firms representing the interests of the German rubber industry, including some of the largest concerns handling rubber goods in the British market, such as the Continental, Metzler, Calmon, and Harburg-Wien. The management of the latter house in England was completely in the hands of English interests and the same condition has existed with British firms in Germany, such as the Dunlop Rubber Co., Limited, which has a large German plant. In many of the less prominent houses, there were employed in both countries a large number of agents doing business for England in Germany and for Germany in England.

The relations between the representatives of the rubber industries of both countries and the buyers of such goods were most cordial. They found their expression repeatedly in the participation of the German manufacturers in the International

Rubber Exhibitions, the last of which closed shortly before the outbreak of the war. It is claimed by some that the interests of these firms are so clearly interwoven that after the war a re-establishment of relations may be possible and that the feeling of distrust which undoubtedly will be left may speedily be overcome. This applies equally well to the relations between the Austrian and British merchants.

Before the war Italy not only bought from Germany a fairly large quantity of tires, but the German exports to Italy of mechanical rubber, hard rubber goods, etc., had been large. This trade has entirely ceased since the outbreak of the war. What the commercial relations between these countries will be after the war, is problematical.

It is difficult to predict how the war will affect the relations between Italy and Austria. These countries after previous wars have soon returned to peaceful trading again. Hence, one may anticipate a fairly early resumption of their commercial intercourse when the political difficulties have been removed.

As an exporter of rubber goods, Italy has never exerted a strong influence upon European trade, although Italian manufacturers had built up a satisfactory export business and the London market was well supplied with Italian goods. Those made by Pirelli & Co. are especially well known. This firm and other Italian manufacturers may benefit after the war by any decrease in German exports to England.

The situation between Germany and France presents greater difficulties, for between their rubber industries considerable competition has existed for some time past which, as an industrial conflict, has been shown by boycotts and in other ways. It is said that the French market was fast becoming of less value to the German manufacturers. Opinions seem to indicate that after the war this trade will cease altogether.

France is not producing all the rubber goods she needs and the lack of German imports, having a value of about \$3,500,000, should have a decided effect on the French rubber trade. If, after the war, cordial commercial relations are not resumed with Germany, France will either be compelled to expand the producing power of her rubber industry immensely or she will have to look about for some other source of supplies.

It should be remembered that France has built up an export trade, especially in tires. The French tire industry has gained a large export demand, mostly through the fame of her motor industry. French motor cars winning races all over the world have helped to introduce the tire products of the French rubber manufacturers, who have taken good care of the openings thus made. French tires were sold in large quantities in the British and other European markets, and French manufacturers are of the opinion that they will be able to replace German tires in England after the war. How far this will be possible will depend upon conditions existing at the conclusion of peace.

The German rubber goods sold in France consisted largely of mechanical goods and tires. The former may not be easily replaced by French makers, as the demand for this class of goods promises to become enormous. Tires are a French specialty which the domestic manufacturers are able to furnish in sufficient supply for home consumption.

The English rubber industry naturally is in a more favorable position than that of the other countries at war, for England has been able to keep her export business open. The strength of London is in its capability to distribute goods. In the past it has acted mostly as a receiver or intermediary for the continental rubber industries. Whether it will retain this position

will depend largely on the settlement of the British dispute with Germany.

The increasing influence of Antwerp must not be forgotten. This city has made great progress in former years and it is predicted that its position after the war will be still more influential, endangering not only London as a distributing center but Hamburg as well. The realization of the immense possibilities of Antwerp dates back to the middle of the last century. Only the great financial influence exerted by London has kept it from becoming the most important port of Europe.

Conditions in Russia are not clear. It is said that in Russia the sentiment has been very favorable to Germany and consequently it is thought that no great difficulty will be encountered in returning to normal trading conditions. Some merchants feel that the war will have but little influence on the turnover of German and Austrian rubber goods in Russia.

The markets affected by the war are producing about half of the rubber goods made in the world, and these markets are consuming a large part of that which is made. The important question for manufacturers to ask is: Will the volume of trade in rubber goods increase or decrease after the war?

At present the general opinion seems to be that for the first few years after the war the production in the rubber industry of Europe will increase by leaps and bounds, provided there is sufficient raw material available. Rubber goods of great value have already been destroyed, and more will be wasted before the war comes to an end. These goods must needs be replaced.

At this time, one cannot predict with any degree of certainty whether a decrease of the general rubber trade may be expected after the readjustment of European economic conditions. The increasing use of automobiles and possible new uses for rubber may bring added business to the industry of Europe and prevent a serious falling off of manufacturing when the rush of after-war orders have been filled.

NEW FORM OF RUBBER GUARANTEE.

THE British Consul-General at New York has informed the secretary of The Rubber Club of America, Inc., of a change in the rubber guarantees required by that government. These read the same as the previous forms, with the exception of one paragraph, which now reads:

We will not sell the rubber now delivered by you [nor any raw rubber, reclaimed rubber or waste rubber, whether the same has been imported from British Dominions or not] to any dealer or other person or persons in the United States, but will use it for our own manufacturing purposes.

The addition to the former forms is enclosed in brackets. Other than this, the entire guarantee remains as before.

In addition, a new form, No. 3, is presented, which is required to be signed by reclaimers, in respect to scrap or waste rubber imported from Great Britain or British possessions. This reads:

In consideration of your consenting to the delivery to me of the rubber specified in the margin, I undertake that I will not, directly or indirectly, at any time so long as Great Britain is at war with any European country, export any raw rubber, reclaimed rubber, waste or scrap rubber from the United States, except to the British Dominions, and that I will not sell any raw rubber, reclaimed rubber, waste or scrap rubber for exportation without satisfying myself that it is not intended for exportation from the United States except to the British Dominions.

I further undertake that I will not sell any raw rubber, reclaimed rubber, waste or scrap rubber to any person, firm or corporation in the United States without satisfying myself, so far as possible, that the purchaser has signed the British Rubber Guarantee.

RECENT BRITISH RULING ON INSULATED WIRE.

The British Government has recently decided that on account of their military importance, insulated electric wire, cables and wire of all descriptions, even though containing 5 per cent and less of rubber, must be shipped by way of the United Kingdom.

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless, they are of interest, not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

[168.] A correspondent desires the names of manufacturers of rubber tissue.

[169.] An inquiry has been received for the address of a reliable maker of rubber enemas, manufactured in one piece without any connection part.

[170.] A special type of jelutong is desired in quantity by a rubber cement firm.

[171.] Names of tire fabric makers have been requested.

[172.] A rubber factory promoter seeks information regarding a continuous process tire building machine.

[173.] A Canadian concern desires to be placed in touch with manufacturers of rubber valve cutting machines.

[174.] Names of dealers in rubber scrap have been requested.

[175.] A correspondent seeks information regarding a thorough test for cured rubber.

[176.] A rubber manufacturer seeks information to aid in the cure of a poison rash affecting a workman who handles compounds and several grades of rubber.

[177.] Inquiry has been received for names of manufacturers of grinding mills ordinarily used for grinding or pulverizing junk or scrap rubber for reclaiming purposes.

[178.] Information is desired by a correspondent on the dipping process in the rubber industry.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A Spanish agent desires to represent American manufacturers of rubber tires for carriages and automobiles. Report No. 20,856.

Full information from American manufacturers of insulating materials is desired by an applicant in an insular possession. Report No. 20,905.

A firm in the Far East requests catalogs, quotations, etc., from American manufacturers of rubber supplies, such as gloves and hot water bags. Report No. 20,908.

Commercial relations are sought by a Brazilian firm with American importers of rubber. Report No. 20,969.

An applicant in Australia would like to communicate with American manufacturers of rubber goods for druggists. Report No. 20,993.

Catalogs and price lists are solicited by a firm in Italy from American manufacturers of toys, rubber balls, etc. Report No. 21,059.

There is a growing demand for chewing gum among the Chinese. Names of firms and others interested may be obtained. Report No. 21,092.

Commission agents in Greece would like to be placed in touch with American exporters of dress shields. Report No. 21,100.

A merchant in Spain desires to import rubber, gutta percha and celluloid articles. Report No. 21,129.

An agent in Norway wishes to represent American manufacturers of electrical insulated wires, tubing, etc. Report No. 21,232.

An applicant in Denmark is in the market for American rubber combs. Report No. 21,243.

* * *

Sealed proposals for 200,000 yards of waterproof fabric will be received until June 12 at the office of the Depot Quartermaster, Boston, Massachusetts, for furnishing at either the Boston, New York or Philadelphia depots of the Quartermaster Corps, United States Army.

What the Rubber Chemists Are Doing.

SYNTHESIS AND STRUCTURE OF CAOUTCHOUCS.

THE researches of I. I. Ostromyslenski and F. F. Koschelev on the chemistry of caoutchouc are here condensed from the abstracts published in the Journal of the Society of Chemical Industry (March 31, 1916). The authors find that much of the work published since 1911 on the polymerization of the diolefines is inaccurate and many of the patents are useless. These papers describe peculiar processes of isomerization of two different forms of isoprene-caoutchouc and methods for the catalytic polymerization of diolefines, both to normal and abnormal caoutchoucs. These methods give practically quantitative results.

Caouprene bromide is identical with the symmetrical bromide of erythrene-caoutchouc. Removal of hydrogen bromide from either yields dehydrocaouprene and a homologous compound is similarly obtained from the bromide of natural Para caoutchouc.

Reduction of caouprene bromide by zinc dust yields erythrene-caoutchouc and more or less isomeric caouprene. Caouprene is transparent and forms either a viscous liquid or an amorphous, elastic mass. Benzoyl peroxide at 140 to 158 degrees F. converts caouprene into normal erythrene-caoutchouc.

SYNTHESIS OF NATURAL CAOUTCHOUC BY WAY OF B-MYRCENE.

Isoprene heated cautiously at 176 to 194 degrees F. yields B-myrcene. This hydrocarbon is a colorless, mobile liquid, soluble in all the organic solvents. When heated with sodium and barium peroxide at 140 to 158 degrees F. it is converted quantitatively into normal isoprene caoutchouc, whereas under similar conditions isoprene gives an abnormal caoutchouc.

STRUCTURE OF CAOUTCHOUCS.

The bromide of natural caoutchouc is homologous with caouprene bromide and possesses unicyclic structure. Under the action of zinc dust it is converted readily and quantitatively into free caoutchouc; therefore the latter possesses a unicyclic structure. Willstätter has shown that multi-membered unicyclic groupings of unsaturated hydrocarbons are readily transformed into polycyclic groupings, and Harries has proposed for natural caoutchouc a structure in which such isomerism is assumed. That free caoutchouc and its halogen compounds possess unicyclic structures has been demonstrated experimentally.

The conversion of unsaturated compounds into cyclic compounds may be regarded as a process of intramolecular polymerization. For example, in the polymerization of vinyl bromide, at the moment when the trimeride appears, the action proceeds in two directions: (1) A small part of the trimeride undergoes intramolecular polymerization with formation of the stable six-membered ring compound, 1,3,5-tribromocyclohexane; (2) The remainder of the trimeride unites with unchanged monomeride until a 32-membered chain of carbon atoms is formed. This then undergoes ring formation to form the symmetrical bromide of erythrene-caoutchouc.

CONVERSION OF ISOPRENE AND B-MYRCENE INTO CAOUTCHOUC.

The discovery of the formation of B-myrcene in the process of conversion of isoprene into caoutchouc throws light on the mechanism of this process. In the first phase, the hydrogen atom and the residual radicle from a molecule of isoprene combine at the ethylenic linking of a second

molecule, giving the dimeride, B-myrcene. The latter is then converted into the trimeride, and so on, until the octameride is formed. This then undergoes "intramolecular polymerization" to isoprene-caoutchouc. This polymerization of chemically pure B-myrcene may possibly represent the only synthesis of natural caoutchouc, that is, of a substance perfectly identical with natural Para caoutchouc, both in the general structure of its nucleus and also in the positions of the methyl groups and double linkings of the molecule. There is reason to believe that tropical plants synthesize natural caoutchouc by way of B-myrcene or myrcene-like hydrocarbons or their dimerides and not by the polymerization of isoprene. The sap of plants frequently contains compounds with an atom grouping like that of myrcene, such as geraniol, linalool, nerol, etc., and dehydration of these unsaturated alcohols would lead immediately to the corresponding myrcenes.

COMPARISON OF BRAZILIAN AND PLANTATION METHODS OF PREPARING PARA RUBBER.

G. Stafford Whitby recently reported the results of his researches on this topic before the London Section of the Society of Chemical Industry.

In order to obtain strictly comparable results, the two methods mentioned were applied to separate portions of the same lot of freshly tapped latex. The Brazilian method employed for the preparation of the fine hard Para rubber was followed as closely as possible, the latex being coagulated on a paddle in smoke from burning wood and palm nuts. The plantation method adopted as typical was the preparation of smoked sheet by diluting the latex, coagulating it with acetic acid (0.5 per cent of the weight of dry rubber), holding out the coagulum, drying the sheets, and finally, hanging them in a smoke house for 22 days. The products obtained by these two methods were subjected to precisely similar vulcanization tests, the results of which were expressed in accordance with a scheme worked out by P. Schidrowitz to indicate the duration of heating required for a "perfect" cure and the mechanical properties of the vulcanized product.

The results indicate that the Brazilian method is not superior to the plantation method, and the rubber coagulated by the Brazilian method required longer curing in the vulcanization tests. Such differences as were observed the author attributed in part to a specific and deleterious action of phenolic substances derived from the smoke, and the presence of formaldehyde may also be responsible to some extent.

From vulcanization tests on a very large number of samples, the author concluded that oxidation and the discoloration which it produces have no effect on the vulcanizing properties of the rubber. The outer and more discolored portions of balls of fine hard Para rubber were found to be equal in quality to the inner portions.

Separate investigation of rubber from young and from old trees gave no support to the widely accepted opinion that the latex from young trees is inferior.

In further experiments it was ascertained that air-dried plantation sheet rubber is quite equal, if not superior, in quality to smoked sheet rubber.

In the discussion following the paper Professor Henry E. Armstrong said that the impression he had formed when recently in Ceylon was that they understood very little of what they were doing, and that more research work was

necessary in regard to rubber than was being practiced at the present time.

Dr. Stevens said that for some years there had been research stations in Ceylon and Malaya. Rubber stations have been carrying out work for six or seven years past, and researches have also been carried out at the Imperial Institute and in private laboratories.

OXIDATION OF HEVEA RUBBER.

The experiments of M. Kerbosch on the oxidizability of rubber of *Hevea Brasiliensis* (Bulletin of Agricultural Intelligence, 1915, Vol. 6, page 1703) show that rubber under the influence of sunlight and of diffused daylight gave the following results: Rubber prepared by evaporation of the latex resists oxidation better than that prepared by coagulation. The difference is due to the presence in the former of certain unidentified soluble constituents of the latex. The oxidizability of the rubber is not affected by the presence of quebrachite. The superiority of the Brazilian method of coagulation is probably due chiefly to the retention of the soluble constituents mentioned, and not to the smoking operation.

NEW COAGULANTS FOR RUBBER LATEX.

HEVESA latex is readily coagulated when acidified. It is not desirable to accomplish this by permitting the latex to become rancid because of the important loss of uncoagulated rubber in the waste serum of the latex. In consequence, acetic acid has been generally adopted as the preferred coagulant in the preparation of plantation rubber.

Since the beginning of the war the price of acetic acid has risen from about ten cents to 60 cents per pound, and is almost unobtainable owing to lack of transportation facilities.

The serious shortage thus caused has resulted in a thorough search for a substitute for the very large quantity of acetic acid required on the rubber plantations throughout the Far East. Among the substitute reagents suggested but not generally adopted are sulphuric, hydrochloric, nitric, oxalic, tannic, carbolic, tartaric and citric acids, corrosive sublimate and acid potassium tartrate. Aside from the merits of these chemicals as coagulants, they are in scarcely better position than acetic acid as regards price and transportation to the plantations. Acetic acid can be made cheaply and in ample quantity from cocoanut shells. The crude product is not sufficiently clear in color for the coagulation of rubber that is to be made into first latex crepe, but good, clear, smoked sheet can be and is being made in large quantities with it.

For the production of first latex crepe a better substitute for glacial acetic acid is necessary. This has apparently been found. It is well known that in all parts of the tropics there are many strongly acid fruits, water extracts of the juices of which readily coagulate rubber latex. Shortly after the beginning of the war cocoanut water, and cocoanut vinegar were found to be suitable coagulants; especially cocoanut water, which is now being regularly used on some rubber estates. The process consists in allowing the cocoanut water to ferment for four or five days, after which it can be used immediately for coagulating latex. It is said to produce better rubber than that procured by using crude acetic acid, especially as regards color.

Ceylon is said to produce enough cocoanut shells to provide sufficient acetic acid for all the smoked sheet rubber made in Ceylon and perhaps in the whole East. At the same time the available supply of cocoanut water would doubtless practically supply the requirements for the production of first latex rubber, and the entire rearrangement become a profitable one both to growers of cocoanuts and of rubber.

PROPERTIES OF VULCANIZED RUBBER.

THE relationship of mechanical to chemical properties of vulcanized rubber has been studied by Philip Schidrowitz and H. D. Goldsbrough, who have published in the "India Rubber Journal" (April 8) notes on the preliminary results obtained. The experimental methods employed were as follows:

MIXING.—Standard mixing of 100 parts rubber and 8 parts sulphur.

CURING.—Standard cure, in screw molds, in live steam at 286 degrees F.

CORRECT CURE (Rate of cure).—This was determined by the optimum cure method ("Rubber Industry," 1914, page 212).

The examination of many hundreds of samples demonstrates that the optimum cure method of estimating the correct cure gives in practice concordant results, and actually represents the best product obtainable under the conditions of mixing, curing and testing.

SLOPE OF CURVE (Type).—As a matter of convenience the slope of curve is represented by the figure corresponding to the expression

$$T = \frac{E_1 - E_2}{2.5}$$

E_1 = elongation at a load of 600 grams per square millimeter and E_2 = that at a load of 1,040 grams per square millimeter. For any given load the extension will be greater for the flatter curve. This fact is of fundamental importance.

INSOLUBLE MATTER.—This was determined by difference [Schidrowitz, "Rubber" (Methuen, 1911), p. 252].

SOLUBLE MATTER.—Caspary's method, and his distinction between "soluble" and "pectous" rubber was observed.

COMBINED SULPHUR.—This was estimated in the rubber after exhaustive extraction with acetone.

Number.	Nature.	Correct Cure. (Hrs.)	Slope of Curve. (Type)	Lbs. per Square Inch.	Elongation at Break (Type)	(Original = 1.)	Insoluble Matter.	Soluble Matter.	Combined Sulphur. (Per Cent.)
1—Smoked sheet...		38	2,118	× 10.39	10.80	81.9	4.37		
2—Smoked sheet...		33	2,250	× 10.74	8.88	81.3	4.96		
3—Plain sheet...		33	2,109	× 10.66	7.52	28.8	2.88		
4—Plain sheet...		31	2,450	× 11.00	6.64	80.55	2.03		
5—Smoked sheet...		134	2,100	× 10.43	11.52	81.1	4.30		
6—Smoked sheet...		37	2,110	× 10.35	10.16	76.4	4.70		
7—Film sheet...		37	2,528	× 10.56	7.52	94.85	4.21		
8—Film sheet...		134	2,389	× 10.78	17.20	81.75	4.70		
9—Pará...		38	2,093	× 10.43	.....	.....	3.62		

As far as they go, these results do not support the suggestion made by B. J. Eaton that the amount of combined sulphur at the correct rate of cure may be more or less a constant, like the mechanical properties. It should be noted that the two plain sheet samples, while not differing greatly as regards mechanical properties from the smoked sheet samples, both show a very much lower "combined" sulphur content.

LAYING OF THE CORNER STONE OF THE CHEMISTRY BUILDING OF THE BUREAU OF STANDARDS, WASHINGTON.

On March 23, the corner stone of the new chemistry building of the Bureau of Standards, at Washington, D. C., was laid by the Hon. William C. Redfield, Secretary of Commerce. The building is about 60 × 200 feet, constructed of brick and stone, and is to be four stories in height, in addition to attic and basement. It will provide adequate laboratory space for about 120 chemists, besides rooms for offices, supplies, etc. It will probably be ready for occupancy early in the spring of 1917.

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

CHEMICAL TREATMENT OF RUBBER.

THE UNITED STATES.

COATING COMPOSITION. A new product, the oil of Pontianak rubber resin. [Carlton Ellis and Alfred A. Wells, Montclair, New Jersey. United States patent No. 1,179,413.]

THE UNITED KINGDOM.

SYNTHETIC CAOUTCHOUC. Isoprene and synthetic caoutchouc substances are prepared by the following processes: (1) Treating with fuming sulphuric acid a mixture of an aliphatic ketone with an aliphatic alcohol or ether. Example, a mixture of acetone and ethyl alcohol or ether is treated, the reaction mixture is cooled and volatile products distilled off. (2) Passing ethylene or its homologues through a heated mixture of acetone or its homologues with fuming sulphuric acid, giving isoprene and caoutchouc. Propylene, butylene, or amylene and methyl-ethylketone, diethylketone, dipropylketone, are also specified as parent materials. (3) Passing ethylene or its homologues, or the corresponding alcohol vapors, together with vaporized acetone or its homologues, through a red-hot tube, with or without a dehydrating agent, and collecting the reaction products in fuming sulphuric acid. [H. Stern, 42 Karlstrasse, Munich, Germany. British patent No. 297 (1915).]

THE GERMAN EMPIRE.

RUBBER SUBSTITUTE. Sulphurized oils fluid at the ordinary temperature are treated with dilute nitric acid to obtain a product which can be vulcanized like rubber. It is not completely soluble in any known solvent, but swells up with carbon bisulphide, benzol, etc., to a gelatinous mass, which on evaporation of the solvent leaves a tough elastic residue which can be used for many purposes as a rubber substitute. [H. Bayer, Vienna, German patent No. 288,968 (1914).]

THE FRENCH REPUBLIC.

VULCANIZING RUBBER CEMENT BY ULTRA VIOLET RAYS. The process consists in exposing thin layers of pure rubber, a fraction of a millimeter thick, to the action of ultra-violet rays from a mercury quartz lamp using 220 volts, 3 amperes of current. The surfaces to be united are held by mechanical means at a distance of 5 centimeters from the lamp. The exposure required is about 40 seconds. The vulcanizing agent may be free sulphur, metallic sulphides or metallic sulphides in the presence of bisulphide of carbon. Extremely dilute solutions of rubber are successfully used for cementing surfaces by this method because the surfaces freely absorb the solution and the vulcanizing effect of the ultra-violet rays converts the cementing medium into a strong elastic binder. [H. Olivier. French patent No. 477,204.]

OTHER CHEMICAL PATENTS.

UNITED KINGDOM.

140 (1915). Coating compositions. S. Graves, Lister Building, St. Louis, Mo.
100,092 (1916). Lithopane. R. B. Llopert, 740 Santa Rosa street, Cordoba, Argentina, S. A.

POROSITY IN RUBBER GOODS.

The porosity of rubber as it occurs in the manufacture of goods is due to one or more of several factors. Surface porosity is usually caused by condensation of steam on the goods during vulcanization. In the case of goods cured embedded in talc in open steam, drops of water sometimes percolate through the talc to the rubber and cause uneven vulcanization, by locally reducing the temperature. This danger may be practically eliminated by protecting the receptacle for the goods with a sheet metal covering to shed the water. In the case of wrapped goods, moistening the wrapper will prevent blowing. Internal porosity is caused by moisture in the rubber or compound, by the use of a low-grade, weak rubber in whole or in part, or by over-milling the stock in

breaking down the gum or compounding. Porosity in molded goods may be due to imperfect closure of the mold or to insufficient stock to fill the mold.

LABORATORY APPARATUS.

VISCOSITY INSTRUMENT.

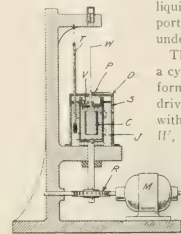
In a paper presented by H. C. Hayes, professor of physics, and G. W. Lewis, assistant professor of engineering, both at Swarthmore College, at the spring meeting of the American Society of Mechanical Engineers held at New Orleans, Louisiana, last April a new form of viscosimeter was described. It operates in accordance with the principle that a solid body having a surface of

revolution when suspended in a rotating liquid experiences a torque which is proportional to the viscosity of the liquid under test, such as a lubricating oil.

The specimen, *S*, is contained within a cylindrical chamber that is rotated uniformly by a motor, *M*, through a worm drive, *R*. A cylinder, *C*, is suspended within the specimen by a thin steel wire, *W*, so that the axes of the rotating liquid and the cylinder coincide.

A cap, *V*, shaped so that the excess liquid can overflow when the cap is seated and thus give constant conditions within the specimen chamber, is provided. The specimen chamber is surrounded by an oil jacket, *J*, in which a thermometer, *T*, is suspended. The jacket oil may be brought to any desired temperature by a heating coil. The cover of the jacket chamber, *D*, has a scale graduated in degrees or may be calibrated to read the viscosity in terms of a standard liquid directly through the deflection of the pointer, *P*. The specimen chamber and the suspended cylinder are both made of copper to insure a constant temperature throughout the specimen, and the outside of the specimen chamber is provided with blades which keep the jacket oil thoroughly mixed as the chamber revolves and thus expose the latter to a uniform temperature. This is an important factor toward insuring constant temperature throughout the specimen.

THE VISCOSITY OF AN OIL IS HERE MEASURED BY THE TWIST GIVEN TO A BODY WHEN OIL CHAMBER IS REVOLVED.



Experimental work conducted with the machine has shown that the temperature of the specimen is uniform to within a small fraction of a degree and follows that of the jacket oil so closely that the temperature viscosity curve can be taken while the temperature is slowly raised or lowered. This has proved to be a great saving of time and labor, as it is not necessary for the operator to stand by the instrument continually. The deflection of the pointer is at any instant a measure of the viscosity, so that all that is required is to take simultaneous readings of temperature and deflection at intervals in the heating or cooling process.

RESISTANCE GLASS.

The war has stimulated the production in America of resistance glass for chemical and other purposes. There are now on the market several excellent brands of this material, capable of filling the severest requirements. Among these may be mentioned the "Pyrex" laboratory glassware of the Corning Glass Works, Corning, New York; Fry resistance glass, H. C. Fry Glass Co., Rochester, Pennsylvania; "Vitreoscil," Henry Heil Chemical Co., St. Louis, Missouri; Transparent quartz glass, Hanovia Chemical Manufacturing Co., Newark, New Jersey; "Nonsol" glass, Whitall-Tatum Co., New York City; "Insol" glass, Lenz & Naumann, Inc., New York City.

The Commercial Production of Benzol.

Note that prices of solvents used in the rubber industry have greatly advanced, the following account of the manufacture of benzol is particularly timely and interesting. It is summarized from a comprehensive article by J. Albert Robinson, in the "Quarterly of the Natural Fire Protective Association." The illustrations are from plants erected by the H. Koppers Co., Pittsburgh, Pennsylvania.

BENZOL recovery, from coal gas residuals of gas works and the by-product coke ovens, has become a great industry new to this country, on a scale of real commercial importance. The recovery of the valuable by-products, such as tar and other residuals, and the extraction from the gas itself of ammonia and benzol has proved a source of great revenue to the coal

the amount distilling at 212 degrees F. The lower boiling benzols have the following approximate composition:

BENZOLS.	100%	90%	50%
Benzene	94	97.5	80-85%
Toluene	2	6	10-20%
Xylene	0-1%	0-5%	0-25%

In general, the use of all grades of benzol has been for solvents. They are excellent solvents for gums, resins, greases, rubber, etc., and it is mainly upon the wide and varied solvent power of benzol that their commercial utilization has rested.

The present impetus has been given the industry for the production of explosives. Aniline oil and synthetic carboic acid have been manufactured in this country in a small way for technical purposes.

It is thought that benzol will find a ready market as an automobile fuel after the war. Experiments for automobile purposes show that benzol has a motive power about 25 per cent better than gasoline; consequently it would have that advantage at the same price. With the present immense production of benzol, the cost has been reduced so that it could actually be produced



BATTERY OF 50 KOPPERS BY-PRODUCT COKE OVENS.

gas producer, and this business has become a very important agent for the conservation of a great natural resource.

Owing to the custom of candle power standard, instead of the scientific method of heat value standard, most of the benzol recovered at the present time is from by-product coke-oven gas.

COAL TAR.

Coal tar is the oily mixture which separates from the gases formed in the destructive distillation of coal. The raw tar is composed of light oils, pyridine bases, phenols, naphthalene, anthracene, heavy oils, pitch; also materials insoluble in benzene, such as free carbon, water, ammonia and dissolved constituents of the gas. It varies greatly in composition, and may be divided into retort gas tar and oven gas tar.

RETORT GAS TAR.—The retort gas tar is obtained as a condensation product in the hydraulic mains, scrubbers or condensers in the manufacture of coal gas for illuminating purposes.

OVEN GAS TAR.—This material is obtained in the distillation of coal in retort or by-product coke ovens. It is similar to gas tar, but is more fluid. It contains more of the hydrocarbons, and considerably less free carbon.

One ton of good gas coal yields about 10,000 cubic feet of gas, 1,400 pounds of coke, and 120 pounds, or 20 gallons, of tar. Not over 2 per cent of this tar consists of benzol, while 2 gallons of benzol may be recovered from the gas given off from the same amount of coal. It is estimated that benzol is now being produced at the rate of 15,000,000 gallons a year in the large steel works alone, an amount five times greater than before the war.

Pure benzol, or benzene, has the formula C_6H_6 . A similar product of the same formula is found in crude petroleum, and is known as benzine. The distinction in spelling should be noted.

Commercially, benzol is known as 50 per cent, 90 per cent and 100 per cent benzol, these consisting mainly of benzene and toluene, with small amounts of xylene. This percentage does not indicate the comparative purity of the materials, but merely



GAS SCRUBBERS FOR BENZOL EXTRACTION, KOPPERS' SYSTEM.

now, and sold at the same price as gasoline if it were necessary to do so. The use of gasoline for automobile fuel is so large (100,000,000 gallons per year) that it is with difficulty that the oil companies are able to produce enough to meet the demand.

METHODS OF RECOVERY OF BENZOL.

The recovery of benzol, etc., from gas is carried out in two principal steps: Scrubbing or washing, and extracting or covering.

After the gas has been cooled to the required temperature, it is admitted into the benzol washers, where it is brought into intimate contact with wash oils which at low temperatures are capable of dissolving out of the gas all the constituents, which go to make up what is commercially known as crude or 50 per cent benzol. The wash oil containing the benzol will again release these constituents after being heated to about 266 degrees F., and further separation takes place by distillation.

SCRUBBING OR WASHING.—The wash oil, called "straw oil" at the works, is a petroleum product which is virtually a light machine oil, free from water, having a low naphthalene content, and a flash point of 300 degrees F., or more. The gas is passed



BENZOL STILLS.

through one or more water tanks, then through several scrubbers, consisting of tall iron towers, through which the gas passes upward and encounters a downflow of straw oil. The oil may be sprayed, or spread out over the hurdles or trays contained in the towers. By thorough scrubbing it is possible to remove practically all of the benzol, etc., from the gas.

The scrubbed gas is passed through a drip tank, and then sent to the gas manufacturing division of the works to be burned under the ovens, sent to gas enriching plant or direct to gas holders. The saturated wash oil, or "charged oil," is delivered to near-by storage tanks, from which it is pumped to a storage tank on the roof of still house at the recovery plant.

EXTRACTING OR RECOVERY.—The processes in this plant are essentially the heating of the wash oil to drive off the absorbed benzol constituents, the recovery and cooling of the wash oil, and the separation by distillation of these benzol constituents to a greater or less degree. There may or may not be present an elaborate rectification plant for recovering benzol of 90 per cent or more purity. In the ordinary separation of a light oil, or primary oil, 80 per cent benzol may be attained, and the secondary or heavy oil will contain toluol, xylol, etc. These oils may be shipped away for further refining at the plant where they are to be used.

The detailed methods of recovery vary, and an exact account of any one plant would not apply to all. The process is rather involved, but the fundamental features are about as follows:

In order to use as small an amount of steam as possible for heating the charged oil, methods of preheating are used. The cold wash oil enters a preheater, where it is heated to about 175 degrees F., by benzol and steam vapors issuing from the still. This oil now passes through a second preheater in which it is preheated to a temperature of about 212 degrees F., by means of the hot debenzolized wash oil issuing from the still. The lighter products of benzol begin to vaporize and leave the oil. It is then heated to about 266 degrees F., by means of live steam in one of the superheaters, for the purpose of driving off the water contained in it and thus rendering it possible to separate the naphthalene. The naphthalene is washed from the gas

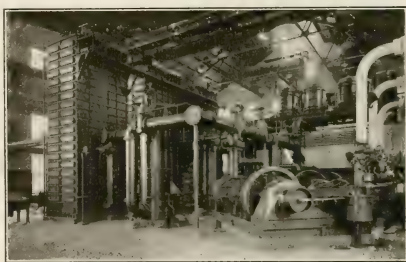
and absorbed by the oil in a manner similar to washing out benzol in the scrubbers.

At the temperature of 266 degrees F., in the superheater, all benzol, toluol and water is expelled, and the oil with its remaining burden, xylol, solvent naphtha and naphthalene, now enters the still. The oil flows through the lower portion of this apparatus, the steam being blown directly into the lowest part of the still, thence traveling in a direction counter to that of the oil, thus driving off all xylol, solvent naphtha, and most of the naphthalene from the wash oil.

The resultant mixture of benzol and water vapors passes through the upper portion of the still, where crude rectification is performed and where all entrained wash oil particles are separated from the vapors. The benzol and water vapors issuing from the superheater enter the upper portion of the still, where they are rectified in conjunction with the other vapors.

These vapors now issue from the top of the still at a temperature of about 220 degrees F., and enter the first superheater, previously mentioned, where they are nearly all condensed and the wash oil receives a preliminary heating. The remaining vapors and the condensates formed in the superheater then enter a water cooler, where the vapors are completely condensed, and all condensates, water and light oils, enter a separator or decanter, where they are separated due to their difference in specific gravity.

The wash oil, which has been freed from benzol, etc., leaves the still at a temperature of about 257 degrees F., and enters the superheater previously referred to, where it transfers a portion of its heat to the charged wash oil, after which it enters the oil cooler, where it is cooled by water to a temperature below 77 degrees F. It may pass over a series of circulation coils through which cold water is passing, arranged one above the other ver-



GAS WASHERS, TAR EXTRACTORS AND GAS EXHAUSTERS.

The rectangular stacks on the left are bell washers for removing ammonia from the gas. The elevated tanks are for liquor storage and feed.

tically; the oil flows down over the whole coil, being caught in a trough at the bottom.

A further distillation may take place and the various benzol products be separated and sent to their respective storage tanks. Purification of benzol, etc., is accomplished by washing with sulphuric acid, caustic soda, and washing and then distilling, for a final separation of the products, in their desired state of purity. This is generally done, where necessary, at the plant using these materials. From the usual by-product coke oven gases, about the following proportions of hydrocarbons are recovered: Benzol 67 per cent, toluol 16 per cent, xylol 8 per cent, and solvent naphtha 9 per cent.

The United States Geological Survey reports 14,000,000 gallons benzol and other light oils produced in the United States in 1915. In connection with these oils 761,256 pounds

of naphthalene were recovered. Several of the plants are not equipped to separate the different oils found in the crude. Over one-half the output, 7,322,670 gallons crude benzol and light oils, were shipped in tank cars to refineries connected with powder works and other chemical industries; 6,620,090 gallons of crude oils refined at the place of recovery yielded 483,393 gallons of 100 per cent benzol; 1,315,727 gallons of toluol, and 470,425 gallons of solvent naphtha.

Thirty-one coke making establishments with 4,933 by-product ovens contributed to this total, and it is estimated that between eight and nine million tons of coal were carbonized. The annual capacity of the benzol recovery plants



BENZOL PURIFYING APPARATUS.

now in operation is estimated at over 20,000,000 gallons and with the completion of the plants now building will probably exceed 22,000,000 gallons.

DEMOUNTABLE RIM HISTORY.

TO the Editor of THE INDIA RUBBER WORLD:

You have recorded some very interesting history in your May issue, in your story of "Perlman Wins the Demountable Rim Suit." Notwithstanding my present close connection with rim circles, I am not ruffled when I write to register a slight correction in the interest of history. History, it has been well said, is a systematic record of past events, especially the record of events in which man has taken part.

In your opening paragraph you say, that "the first public use of this invention (demountable rim) was in June, 1905, when Thery substituted a new tire for a damaged one in 80 seconds, an unprecedented feat." Conceding for the moment, for the purpose of argument only, that this is true, let us seek its origin and source, for this statement was evidently taken from "La France Automobile" of the issue of June 29, 1905, concerning the Richard-Brasier cars driven in the James Gordon Bennett Cup Race in France, by Thery and Calois, on July 5, 1905, six days later, so that the French motoring magazine actually published this feat before it really occurred.

Looking over the files of all of the foreign and American publications of June and July, 1905, at which time I was editor of "Motor," handling all its technical and editorial matter, I failed to find a single mention paralleling this statement made in "La France Automobile," but I did find mention of the fact everywhere, that clincher tires of Michelin make with a leather band and metal studs were used, and all the photographs of the Richard-Brasier cars used in that race show these tires and plain clincher rims, and Michelin himself advertised this fact in the English and French motoring journals. So, if I am correct in this chronological statement, then I may well say "that youth

longs, and manhood strives, but age remembers," and "La France Automobile" was wrong.

Now, except for the fact that you might think that as a press agent I might be guilty of that charming faculty that members of the Fourth Estate have, *i. e.*, unconscious exaggeration, let me quote from Judge Hunt's decision, who heard the testimony in open court and was, therefore, best able to judge of the truth of the matter as to when a demountable rim of the Perlman type was first publicly used. Judge Hunt says, "invention which was completed by Perlman in the summer of 1903, and which under the evidence must be found, was first publicly used by Perlman on a Royal car in August, 1904." Again, Judge Hunt says, "The French patent to Vinet, November 4, 1904, was considered by the patent office examiner. Perlman made a showing sufficient to overcome the Vinet reference, and thereafter the examiner in the patent office abandoned Vinet. Perlman showed prior invention." Further on, Judge Hunt says that, as he "understood it, Vinet showed a complete ring, not crosscut or split, and failed to show a ring capable of radial movement." Finally, Judge Hunt said that, "in October, 1904, he (Perlman) put his wheels on a Welch car and used it. A number of witnesses say that they went riding in the summer and the fall of 1904 with Mr. Perlman. One witness particularly recorded that he went with Perlman in the Welch car to attend the first Vanderbilt Cup Race, the date of which was 1904."

In the United States Circuit Court of Appeals, the element of time was the only point considered. Judge Lacombe, who wrote the decision of the Court of Appeals, said, "The crucial question here is the date when Perlman reduced to practice the invention which he describes in his patent. The trial court found that the evidence showed beyond a reasonable doubt that the invention was conceived in 1903, and actually put to use on a car in 1904."

"Judge Hunt heard the witnesses for the case, which was tried in the above court. Under these circumstances, if we were in doubt, . . . we should hesitate to disturb the findings of the district court; but from an examination of the testimony, as it is here presented in cold type, we are convinced as Judge Hunt was, . . . but when we have the demountable wheel used in 1904 before us, . . . all doubts as to what Perlman's original invention was are resolved." Finally, Judge Lacombe said, that "we fully concur in Judge Hunt's reasoning and conclusions."

The Court of Appeals has the last say on this matter, and so we must accept their conclusions, and not the mere unsupported statement of a foreign motoring publication as to the first public use of a demountable rim of the Perlman type.

During the past 35 years, it has been my very good fortune, indeed, to be closely associated with many very famous patent cases, notably so, the Lallemand bicycle crank; the Fauber one-piece bicycle hanger crank; the Conrad ball bearing, and the Perlman demountable rim, but none of these have exceeded in public utility, in value and general use the Perlman demountable rim, and if I may paraphrase Dr. Mayo,—"Perlman displayed that type of originality which we call genius, to which discoveries marking epochs are due, but which is given to but few men. The type of which Perlman was a distinguished example, while, perhaps, not arising to a height to be called genius, has been given to many men. The latter phase of originality may best be characterized as scientific imagination, carrying with it a talent for work,—scientific imagination, reasoning from things known to unknown, clarifying and solving problems by what may appear at first to be merely an hypothesis, a leap in the dark, but which is soon to have sound footing in fact."

Everybody knows that a wheel is old, a rim is old and may be moved off and on a wheel, and a wedge is old, but Perlman's idea of connecting these three essential elements together and adding to them the necessary operating parts, made a new combination previously unknown to engineers, and produced a valuable result, *i. e.*, the demountable rim of today.

Yours very truly, ALEX. SCHWALBACH.

Welding Rims by Electricity.

By C. D. Ryder.*

IN the older days of rim manufacture the processes used were more or less crude as compared to present day methods. This is a general statement that may be applied equally well to many industries, and the manufacture of automobile rims is no exception to the rule. Inasmuch as this article is supposed to deal chiefly with the process of welding rims rather than to convey a great deal of information regarding the whole process of manufacture, the writer will try to give a clear idea of this work, the result of observations made in a number of the larger plants, and of experience covering several years' intimate connection with the electrical welding process.

The old original, time-honored method of welding iron or steel involved taking the articles to be welded to the blacksmith shop,

Just here it may be of interest to explain, briefly, what an electric welder is, how it operates and the kind of welds it produces.

Fundamentally, the electric welder depends for its operation upon a well-known law which states that if an electric current is caused to pass through a substance (such as iron or steel) a certain amount of heat will be developed in the substance traversed by the current which will be proportional to the square of the current, the resistance the substance offers to the flow of current, and to the time the current is applied. The final temperature attained by the substance will depend upon the readiness with which this heat is dissipated by radiation and conduction. An electric welder, then, is a machine for securely clamping the parts to be welded in proper alignment, with means for passing a heavy electric current through the abutting ends of metal and with provision for forcing these two ends together to complete the welding operation. The commercial machine is one which not only embodies these three essential features but, in addition, is equipped with means for adjusting the current through a given range of values, to suit the stock to be welded, switching mechanism for applying and turning off the current, and numerous adjustments which are obviously necessary.

Little or no preparation of the stock is required for performing an electric weld. All that is necessary is to have the surfaces fairly clean, to insure good electrical contact of the material in the copper dies or electrodes. No scarring of the ends is done. The heat is developed at the junction of the abutting ends only. When the correct welding temperature is reached, the current is turned off and the ends are forced together by the action of a lever or an hydraulic ram. In the process of forcing the ends together the burnt and oxidized metal is extruded from the weld in the form of a fin, which is quite thin and is easily removed. As all

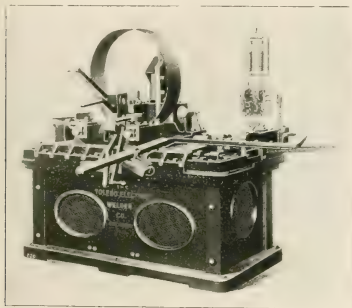


FIG. 1.—17A ELECTRIC WELDER.

which was a distinct and important department in every well regulated factory. The pieces to be welded having been delivered to his "sanctum," the blacksmith proceeded to heat the ends and scarf them down by hammering. He then placed the ends again in the fire, sprinkling a little borax and sand over them to reduce oxidation, and brought them up to the welding heat. Upon attaining the correct temperature, the pieces were withdrawn, the ends overlapped, as provided by the scarf, and the joint hammered to force the two ends of metal together forming a weld. The hammering was continued until the metal at the joint was reduced to about the same dimensions as the original stock. Obviously this method was slow and productive of uncertain results. The strength of a weld made in this way depended altogether on the skill of the blacksmith. It may be said that no matter how skilful the blacksmith or how carefully the joint was made, it could not by any possibility approach very closely the strength of the original stock. The chief reason for this lay in the fact that more or less oxidation takes place in spite of the flux used, which was retained in the weld at the junction of the pieces.

However crude and unsatisfactory the old method may have been, it was the only one which could be used until the advent of the electric welding machine. As a matter of fact, it may be conservatively stated that the electric welding machine has made possible the successful production of automobile wheel rims on a commercial scale. Electric welding is now done, exclusively, in every rim plant in the United States, so far as the writer knows.

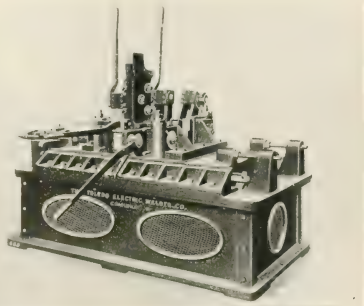


FIG. 2.—15A ELECTRIC WELDER.

the burnt or oxidized metal is thus extruded, leaving only clean metal which has not been touched by the air in final contact, no flux is required and the joint is of maximum strength. Tests made to determine the strength of a weld made in this manner indicate that usually, barring carelessness, the welded portion will show the same strength as any other portion of the stock of like sectional area.

Various methods are employed in the different large plants in the manufacture of automobile rims, but the following

*Electrical Engineer, THE T. L. ELECTRIC WELDER CO., CINCINNATI, OHIO.

brief outline is typical of them all. The stock (either rectangular in cross section or of some special shape) is first cut to the proper length corresponding to the circumference of the rim. It is then formed up into a circle by rolling. The surfaces near the ends are slightly ground or sand blasted to remove the rust and scale to assure good contact in the welding dies. The rim is then placed in the welder for a period of from a few seconds to a minute and a half, depending upon the size of rim, which is the time required for making the weld. After welding, the rim is removed from the welder and the fin removed while red hot, by means of an air chisel, or it is sheared off in a special machine. Next, the welded portion is smoothed down by grinding and the rim brought to exact size by a special hydraulic shrinking machine or if under size, the rim is expanded upon a bulldozer. The subsequent operations necessary to finish the rim for mounting are not of interest in connection with this subject.

It is estimated that approximately 75 per cent of the power taken from the lines is converted into heat and used directly in making the weld. The efficiency of the charcoal, coke, gas or oil fire in no way is comparable to this. Further, the use of the electric method vastly increases the output obtainable over the old method when employing a given number of men. And, moreover, the ends are held in absolute alignment and uniform results always assured.

The following table will give an idea of the current consumed and time taken in making welds by the electric process. In this table the time taken can be reduced by increasing the power, or *vice versa*.

Area Square Inches	Power Kilowatts	Time Seconds	Power Horse-power
1.00	18.75	40	25.0
1.50	29.5	44	39.5
2.00	33.0	57	44.0
3.00	43.5	70	58.5
4.00	56.3	80	76.0
5.00	61.7	90	83.0
6.00	69.0	98	92.5

While there are several machines used for electrical rim welding that are designed to perform a great variety of work, the illustrations and descriptions are of typical rim machines.

The welder shown in Figure 1, welds flat stock up to 6 x ¼ inches, or 1 x ¼ inches, or 1½ inch round stock. This machine is designed for welding automobile rims, which are rolled to size and welded flat. The flat bands are then shaped in special rolls to fit the rubber tires. An exceedingly fine adjustment is obtained in the clamping dies by four eccentrics mounted in the heads and operated by worm gears. After the stock is clamped in the jaws, two levers mounted on cams give the final pressure to avoid the possibility of the stock slipping in the dies. On ordinary stock, 4 inches wide by 9/64 inch thick, a man will weld from 450 to 600 rims per day; 6 x ¼ inches, 350 to 400 per day, and 3¼ x ¼ inches, 600 to 700 per day.

The machine shown in Figure 2 welds rims up to 12 inches wide by ½ inch thick. It requires a heavy and well constructed machine, both mechanically and electrically, to heat and compress a piece of steel 6 square inches in cross section. This type is designed for welding this heavy stock and all parts are necessarily massive and substantially made. It is especially constructed for welding heavy flat band stock.

The Society of Automobile Engineers has issued a sheet showing to what extent the various automobile manufacturing companies are using S. A. E. standards in their manufacture. An examination of this sheet shows that 27 manufacturers of solid tires and 24 manufacturers of pneumatic tires have adopted these standards, while in insulated requirements 12 are using these standards, and 9 have adopted the standard tests of insulating materials.

BRITISH SOLID TIRE RIM STANDARDS AND AMERICAN SIZES.

OUR British contemporary, "Motor Traction," has of late devoted space to a controversy relating to the advisability of prohibiting or, at least, placing a heavy duty upon, the importation of American commercial motor vehicles not conforming to British tire standards.

The British Finance Act, 1915, placed 33½ per cent duty upon imports of motor cars, chassis, motorcycles and parts and accessories of motor cars and motorcycles, except tires. Commercial cars were, however, excepted from the operation of the tax and were also left without mention in a recent royal proclamation prohibiting the importation into Great Britain of pleasure cars and accessories (except tires).

The controversy above referred to was started by an open letter to our contemporary in which it was argued that the importation of American motor trucks, not conforming with British standard tire sizes, would introduce an element of disorganization into the British trade, as there would necessarily be a demand for various American tire sizes for at least 5 or 6 years after they had been placed in service. It was pointed out that after the mutual agreement that had been made between British automobile manufacturers and tire manufacturers, it would be regrettable that American importations should upset all calculations and necessitate different molds, and consequent disorganization, not to mention increased expense in the production of solid tires. It was further stated that for American sizes, British tire manufacturers would be at a disadvantage when competing with American manufacturers. It was, therefore, proposed that a duty of 33½ per cent be levied upon American motor trucks (the same as was levied on pleasure cars before their importation was prohibited altogether), unless they conform to the British standards in construction and equipment.

The matter was taken up by other readers of "Motor Traction," one of whom went so far as to propose that combined pressure be brought to bear to induce the government to absolutely prohibit the importation into Great Britain, her dominions and colonies, of trucks which do not, so far as their wheels are concerned, comply with British standard sizes. British tire manufacturers had been put to great trouble in competing for the business in furnishing odd size tires for trucks which were already in use in England. It could not be expected that users would go to the expense of altering wheels to accommodate British standard tires, and, either the tire manufacturer would have to stand this expense, or continue to produce tires from molds of suitable American sizes.

A correspondent presenting the other side of the case—there are always two sides—pointed out the advantage to the commercial community which had resulted from the free importation of American trucks at a time when British manufacturers were unable to guarantee deliveries and the fact that an examination of American wheel and tire sizes showed that there were only six of these, three of which had been adopted by the American Society of Automobile Engineers as standards. The manufacture of the three or six American sizes was quite a different matter from the manufacture of the multiplicity of millimeter sizes which was taking place in Great Britain prior to the adoption of the British standards. All these old millimeter sizes promise to be wiped out in the course of the next five or six years, as soon as the vehicles become obsolete. The matter is receiving the earnest consideration of British, American, French, Italian and Belgian manufacturers of both tires and automobiles, and there is promise of an international agreement on the subject. Such an agreement would be made difficult should ill feeling be raised by premature action.

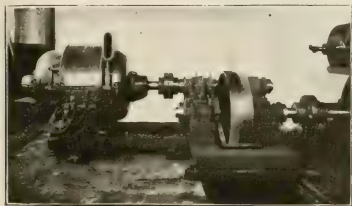
Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

New Machines and Appliances.

THE THROPP REDUCTION GEAR DRIVE.

MOTOR drives are becoming an indispensable aid to the operation of modern rubber mills where efficiency is recognized as one of the main factors of increased production.

Thropp has designed a new 100-horse power drive that is shown equipped with a special General Electric motor of the ventilating type. This is entirely enclosed and provided with an outside air suction vent and discharge pipe. Both motor and drive are bolted to a heavy continuous bed plate, the motor being connected to the jack shaft of the drive by a flexible coupling that allows the motor shaft to oscillate and the double helical gears to float. The jack shaft pinion is machine cut from a solid forging and drives the large cast iron main gear, both of which are the "Maag," double helical cut type of gearing. They are enclosed in oil-tight guards and run in a bath of oil, the bearings being of the newest

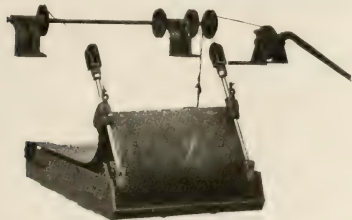


ring oiling type. The main driving shaft runs 100 revolutions and the jack shaft at 575 revolutions per minute. The drive is shown connected to a 2-roll rubber mill. [William R. Thropp & Sons Co., Trenton, New Jersey.]

A NEW APRON FEED FOR MIXERS.

The value of a practical mixing apron is instantly recognized by progressive rubber men, particularly those who have had experience with the ordinary apronless mill. Two illustrations are given here of a device of this character that has recently attracted favorable comment. The first is a front view of the mechanism, ready to be attached to a mixer, while a rear view of the apron is given in the second illustration.

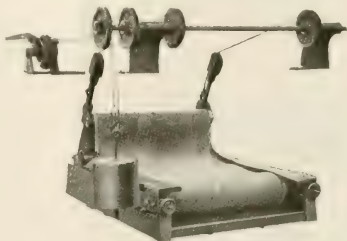
This device consists of a cast iron pan upon which are



fastened bearings and brackets supporting two rolls and also a sliding mechanism carrying a third roll. The apron, in the form of an endless belt, travels over these rolls and is driven by the top roll through direct contact with the front roll of

the mill. The batch is fed to the mill in the usual manner; the apron, however, catches the particles that have not massed and automatically returns them to the rolls.

The sliding mechanism makes it possible to drop the top roll so that the finished batch is easily removed, after which



the roll is again placed in the original position and the mill is ready for another batch.

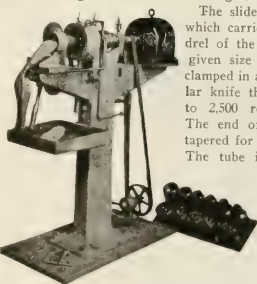
Among the advantages claimed for this mixing apron, safety comes first, for it reduces the possibility of injury to the workman. It eliminates the dust, so troublesome and expensive in ordinary mixing operations, and, moreover, delivers a finished batch of the same weight as the original amount placed in the mill. The saving of 30 to 35 per cent of the time consumed in mixing is another important feature and at the same time the material is delivered in a thoroughly massed condition. [Morgan & Wright, Detroit Rubber Works, Detroit, Michigan.]

THE ALLEN TUBE SKIVING MACHINE WITH MOTOR DRIVE.

An extremely well designed, self contained, inner tube skiving machine is herewith illustrated, showing the consistent progress that is being made in labor saving tube building machinery.

The slide is operated by a lever which carries a hollow brass mandrel of the correct diameter for a given size tube. This mandrel is clamped in alignment with the tubular knife that revolves from 2,000 to 2,500 revolutions per minute. The end of the brass mandrel is tapered for a given length of skive. The tube is then thrust through the center of the mandrel and folded back over the tapered end. The slide is then forced forward by the lever until it comes in contact with the revolving knife

and a sufficient flow of water is automatically released at the time of contact which is also automatically shut off when the slide is brought back to its original position. This feature prevents undue waste of water besides being cleaner, as the excess of water would become sloppy and objectionable. Also the little shutter device over the knife, which operates automatically, prevents the hands of the operator from coming in contact with the knife when placing the end of the tube in position. The



pedestal of the machine also acts as a reservoir for the water which the pump forces to the knife and back again through the splash pan into the pedestal.

The machine is equipped with six knives and mandrels for skiving all sizes of tubes up to and including $3\frac{1}{2}$ inch. It is also furnished with drive with countershaft or direct connection to any motor that the customer may desire. [Allen Machine Co., Erie, Pennsylvania.]

ROLLS FOR REMOVING WRINKLES FROM FABRICS.

The twin screw rolls illustrated herewith are designed as an attachment for calenders, spreaders, bias cutters, brushing, rolling and measuring machines, for the purpose of

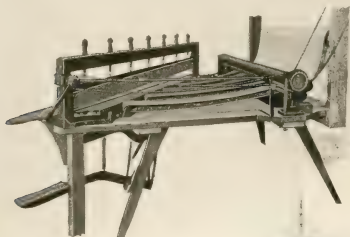
removing wrinkles, puckers and turned edges from the goods. This device is particularly useful in connection with a rolling machine for taking out wrinkles from the liners and wrappers

used in tire and footwear manufacture.

The rolls are cut with right and left-hand threads running from the center towards each end, and are mounted in stands so that they may be turned in any desired position and give as much contact of the cloth as desired on each of the screw rolls. The screw rolls may be adjusted to act on goods running horizontally, vertically, or at any angle. One screw roll acts on one side of the goods and the other screw roll on the opposite side to straighten out the selvages, no matter whether they are inclined to turn over toward the face or the back of the goods. Only one belt is necessary for driving both rolls. The rolls are regularly made of iron, though on special work where there is liability of rust they may be made of brass or other material. [Curtis & Marble Machine Co., Worcester, Massachusetts.]

MILLER'S BIAS FABRIC CUTTER FOR REPAIRMEN.

This is a very useful little machine for repair shops where a considerable volume of work is done. It is operated by a hand crank, or a power attachment can be applied if so desired. As the fabric is taken from the roll, the liner is automatically wound



up on a roller. The machine being set for the required width, the fabric is fed between the knives and by pressing down the foot lever a strip is accurately cut off on the bias.

The machine is useful in the manufacture of tires, reliners, flaps, boots and air-bags and will cut from 20 to 30 strips of fabric per minute. [Charles E. Miller, Anderson, Indiana.]

GAS BURNERS FOR VULCANIZING AND HEATING.

The use of illuminating gas as a heating medium for hard rubber vulcanizing presses is apparently being accepted as good practice by manufacturers of certain kinds of hard rubber goods.

A type of burner that is specially designed for this purpose would therefore be of interest to show the development of gas heat as a vulcanizing agent.

The burner shown in the illustration is of the three-burner type, arranged to be inserted in the chambered press platen through holes drilled in the side for that purpose. A flexible rubber hose that allows for the platen movement connects the header with the gas and air pipes that are fitted with lever valves by which the supply of gas and air is regulated. The number of these burner units usually corresponds to the number of platens in the press and the degrees of heat required. Single burners are furnished for direct mold heating, in fact all sizes are made to suit the quality of gas used and the special purpose for which the burner is intended.



The other illustration shows a powerful burner specially designed for industrial and laboratory purposes. This particular type of burner is used for heating metal furnaces such as are used in melting type metal, for casting soft metal molds. It is easily

adapted as an atmospheric burner if so desired, or it can be arranged to work under air and gas pressure. The burner is made to deliver the required number of heat units in accordance with the work to be performed, and the correct adjustment for the varying quality of gas is also insured. [Tirrill Gas

Machine Lighting Co., New York City.]

THE ADVANCE WASHER CUTTER.

A hand-operated machine that will accurately and quickly cut washers from sheet rubber, leather or asbestos would apparently fill a long-felt want in the repair shop or garage.

A press of the description shown here is made of cast iron and the crankshaft and plunger head are of cold rolled steel. The dies are made of tempered tool steel and turned down at the cutting end to a sharp uniform edge. There are 23 dies in the combination, which will cut 529 different sizes of washers ranging from $\frac{1}{8}$ inch to $3\frac{1}{4}$ inch outside diameter and any size inside diameter within this range. A maple wood cutting block also constitutes a part of the outfit. [Advance Felt Specialty & Cutting Co., Chicago, Illinois.]



VANADIUM STEEL RUBBER SHEARS.

For heavy work in cutting rubber, special shears have been designed, shaped to the hand of the operator, to allow continual use without tiring the wrist. A special feature is the automatic tension, which consists of a coiled spring made of piano wire, sunk in a hollow thimble between the blades. It is entirely out of sight, but with its upward tension it takes up the wear of the screw, keeps the blades in perfect adjustment and doubles the life of the shears. These shears are made of vanadium steel of extra hard temper, specially adapted to the heavy work required of them. [Perfection Shear Co., North Woodbury, Connecticut.]

New Tire Machines.

MOLDING PNEUMATIC TIRES.

THE object of this machine is to compress the tread mold against the tire core and draw the adjacent sides of the casing toward the beads. The side molds compress the casing

adjacent to the beads against the tire core and the edges are stretched from the tread and inwardly toward each other. Thus the fabric plies are stretched smoothing down all wrinkles and uneven surfaces.

The illustration on the left shows a vertical section of this machine in operative position. Base *A* supports the upper cross head by heavy upright rods. The table supports the core *D* and sectional tread mold *E* and normally rests on brackets *F*.

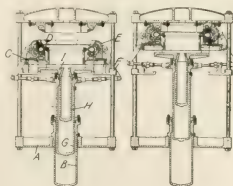
The tire core is placed in the machine and pressure applied to the ram *G* which acts on the levers, forcing the tread mold against the tire. Then pressure is applied to the inner ram *H*, bringing the table *I* in contact with the lower mold, when both tables *C* and *I* are simultaneously raised, forcing the tire against the upper mold by contact with the cross head as seen in the figure on the right. The pressure from both cylinders is then released and tire and core are removed for final curing. [Joseph H. Coffey, Jr., and Joseph H. Coffey, Toronto, Canada, assignors of one-half to Gutta Percha & Rubber, Limited, Toronto, Canada. United States patent No. 1,179,898.]

THROPP'S TIRE BUILDING MACHINE.

This apparatus is particularly adapted for use in connection with the tire making machine covered in United States patent No. 1,119,326, granted to the same inventors, illustrated and described in the January, 1915, issue of THE INDIA RUBBER WORLD.

In the illustration, frame *A* supports the revolving tire core *B* upon which the fabric strips are applied. Frame *D* is attached to the cylinder *C* that is adjusted vertically by screw and bevel gearing. Two stock rolls *E*, *E*, that are journaled in this frame, carry the friction fabric of different widths used in constructing the casing. The wooden rollers *F*, guide the fabric to the revolving core, and tension is applied by weight levers *G*, *G*. The liner strips are wound up on the weighted rollers *H*, *H*, which are driven by contact with the stock rolls.

In operation the plies of narrow fabric are first laid on the core and then the bead cores are applied, after which the wider fabric is laid on while the core is revolved in the reverse direction. Thus the threads of the fabric plies under the bead cores are laid at the same angles and those of the superposed plies are laid the same, but at a different angle to the plies under the bead



cores. [Peter D. Thropp, John E. Thropp, Trenton, New Jersey, and Albert de Laski, Weehawken, New Jersey, assignors to The De Laski & Thropp Circular Woven Tire Co., Trenton, New Jersey. United States patent No. 1,178,874.]

INNER TUBE ROLLING MACHINE.

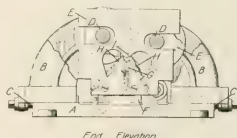
In the manufacture of inner tubes, and for that matter hose generally, sheets of vulcanized rubber are rolled around a hollow mandrel, an operation requiring careful and experienced hand labor. A machine for doing this work is the subject of the following illustrated description.

Referring to the drawing, which is an elevation of one side of the machine *A*, parallel housings *B* are provided with vertically sliding heads *C* connected to the mandrel rolling plate *D*. The vertical movement of this pressure plate is controlled by rollers *E*, sliding over upper and lower tread flanges *F*, *F*.

The mandrel *G* and sheet of rubber stock are placed on the table *H* and the screw threaded shafts *I* set in motion by the belt driven gearing *J*, moving the pressure plate over the table in contact with the mandrel, thereby rolling the sheet of stock around it. The mandrel and tube are then placed in a similar machine which performs the operation of cross wrapping in a like manner. [Elmer S. Current, Beach City, Ohio. United States patent No. 1,179,077.]

TIRE BEAD TRIMMING MACHINE.

Molded beads are substantially triangular in cross section and the excess material on two of the edges known as "flash" must be trimmed off to make them serviceable. This is usually performed by hand, an operation that is comparatively slow and one that is not always productive of uniform results.



Midgley's machine provides a base *A* on which are mounted two pairs of curved brackets *B*, adjustable to and from each other by set screws *C*, and supporting two shafts *D*, *D*, each of which carries four curved cutter blades *E*, *E*. The bead guide block *F*, adjustable longitudinally, is triangular in cross-section and supports the trough-like bead support *G*. Stationary cutters *H*, *H*, vertically adjustable, are attached to the inclined sides of the guide block and a bar *I* restricts the bead to longitudinal movement.

In operation the cutter blades rotate toward each other with a downward cut and exert a shearing action, in connection with the stationary blades, on the bead as it passes through the machine, removing the "flash" in an effective manner. [Thomas Midgley, Detroit, Michigan, assignor to Morgan & Wright, Detroit, Michigan. United States patent No. 1,180,309.]

METHOD AND APPLIANCES FOR BUILDING TIRE CASINGS.

The principal feature in this invention consists in subjecting the outer casing to an internal fluid pressure during vulcanization. Another is an improved form of collapsible core, is illustrated herewith, that does not require sealing at the joints.

Referring to the drawing, *A* is the collapsible core, *B* the valve stems and *C* the fluid-tight tubular casing of rubberized fabric that is placed over the core and provided with openings for the valve stems. At the outer end of each valve stem the tubular casing is held between two circular washers *D* and *E*. The sectional retaining ring *F* is provided with openings for the valves, and when the two mold halves *H* and *G* are bolted together a space *I* is left between the casing and the inner surface of the mold.

When the fluid pressure is applied through the valve stems the steam or hot water is discharged between the inner surface of the tire and the fluid-tight tubular casing surrounding the core. Thus the continued pressure forces the tire against the inner mold surfaces during the period of vulcanization. [W. R. Denman, assignor to Miller Rubber Co., both of Akron, Ohio. United States patent No. 1,176,885.]

REINFORCING INNER TUBES. A tube is placed in a flattened condition around an endless circular form and a strip consisting of fabric on the outside and a layer of rubber on the inside is cemented to the tube. [John H. Poole, Brockton, Massachusetts, assignor to Reinforced Inner Tube Co., Brockton, Massachusetts. United States patent No. 1,179,033.]

MANDRELS FOR SPLICING TUBES. Both inner and outer mandrels are slotted their entire length, the latter being provided with an annular passage through which air is forced, blowing the end of the inner tube that is on the larger mandrel over the end of the tube on the smaller mandrel, thereby forming the splice. [Dempsey Lowe, East Akron, Ohio. United States patent No. 1,179,200.]

A NEW TIRE BUILDING TOOL. This novel tool consists of a round helical spring that revolves on a suitable support and is used as a hand stitcher in tire building. [Wilhelm Kaufmann, New York City, assignor to Hartford Rubber Works, Hartford, Connecticut. United States patent No. 1,179,528.]

TIRE FLAP VULCANIZER. Flaps are made of straight fabric instead of bias strip, formed and vulcanized on a circular-shaped vulcanizer provided with clamps accommodating a plurality of flaps. [Thomas C. Marshall, Akron, Ohio, assignor to Kelly-Springfield Tire Co., Jersey City, New Jersey. United States patent No. 1,179,738.]

BEAD WIRE WRAPPING MACHINE. An endless wire hoop is expanded to nearly the contour of a circle by a series of concentric pulleys which carry it in a circular path through a rotary shuttle that applies the tape helically on the hoop. [Thomas Midgley, Worthington, Ohio, assignor to Morgan & Wright, Detroit, Michigan. United States patent No. 1,179,545.]

BEAD CLEANING MACHINE. Beads are repeatedly passed through guides having helical grooves which present the different faces of the beads to the buffing wheels that remove the dust and bloom. [Thomas Midgley, Worthington, Ohio, assignor to Morgan & Wright, Detroit, Michigan. United States patent No. 1,180,310.]

BUTT-ENDED INNER TUBES. The two ends to be joined are considerably smaller in diameter than the main tube and a locking ring on the extremity of the male end abuts against an annular thickened extremity on the female end. [Dunlop Rubber Co., Limited, 14 Regent street, London, S. W., and Colin Macbeth, Aston, Birmingham, England. British patent No. 4693 (1915).]

PNEUMATIC TIRE MOLD AND CORE. In this type of mold the inner part is closed at the last part of the operation so that the

beads can be inspected before the final closing. [F. A. Byrne, 2 Ludgate Hill, Birmingham, England. British patent No. 9454 (1915).]

MACHINERY PATENTS.

DIPPING AND DRYING MACHINE.

RUBBER articles are made on this machine by successively dipping a form in rubber solution, and drying each coating separately in the presence of heat and a reduced air pressure of a vacuum.

This apparatus is shown in side elevation and plan, the enclosed chamber *A* containing the solution at *B*. The four sprocket wheels *C*, revolved by a hand crank, drive the two endless chain belts *D*, that support a series of cross bars *E* on which the forms *F* are mounted. Paddle wheel *G* acts as an agitator for stirring the solution.

Heat is applied to the upper part of the chamber by steam coils, and in order to maintain the solution at constant, low temperature cooling coils are provided at the bottom of the solution chamber. Should it be desirable to separate the solution from the upper chamber to prevent overheating and evaporation during the drying operation, a two-part sliding partition is fitted in the tank above the solution. Pipes for solution inlet and outlet and vacuum connections are provided. [Carl S. Williams, New York City, assignor to Revere Rubber Co., a corporation of Rhode Island. United States patent No. 1,180,358.]

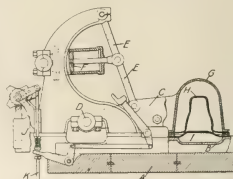
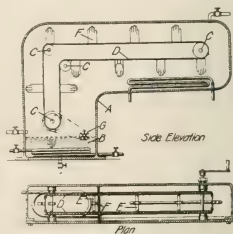
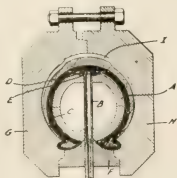
AIR PRESSURE ROLLING MACHINE FOR FOOTWEAR.

In the manufacture of rubber shoes, it is necessary to assemble the various parts on a last, each component part being hand rolled or "stitched" as it is called, to compact the various layers into a homogeneous article.

This hand work requires considerable skill and strength on the part of the operator, all of which is eliminated by this novel machine.

Referring to the illustration, base *A* supports the bed plate that has a depression *B* to accommodate the last to be operated upon. An arm *C* pivoted at *D* is raised and lowered by toggles *E, E* controlled by the air piston *F*. The outer part of this arm constitutes a dome-shaped cover *G* with a bottom flange that cooperates with rings for clamping the rubber diaphragms *H* and *I*. The former approximates the upper shape of the last and the latter conforms to the lower part.

When the cover is raised, the shoe—previously built up on the last without hand rolling—is placed on the lower diaphragm. The cover is then lowered and air or water pressure applied by automatically controlled valves *J*. Thus the air contained within the mold will be forcibly excluded and the diaphragms pressed evenly around the last, firmly compacting the materials of the shoe, which is now ready for vulcanization. [Joseph W. Moore, Newton Highlands, Massachusetts, assignor to Boston Rubber Shoe Co., Boston, Massachusetts. United States patent No. 1,181,083.]

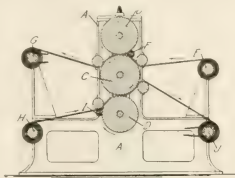


THE KEARNS MULTIPLE FRICTION CALENDER.

In this invention a series of pressure rolls are geared in vertical alignment, driven at different speeds relative to the adjacent roll, and arranged to friction with rubber a plurality of fabric webs.

Referring to the illustration, which is a vertical section of the calendar, *A* designates one of the side frames that support the rolls *B*, *C*, and *D*.

A web of fabric *E* fed by guide rollers, passes under the bank of rubber stock *F*, and between the rolls *B* and *C*, where it is frictioned, and then wound up at *G*. At the same time another web of fabric *H* is fed past the bank of rubber stock *I* and passes between the rolls *C* and *D*, where it is frictioned and finally wound up at *J*. [John Kearns, Chicopee Falls, Massachusetts, assignor to Fisk Rubber Co., Chicopee Falls, Massachusetts. United States patent No. 1,179,634.]



TUBING MACHINE FEED. A roll located in the feed hopper, forces the material between the convolutions of the stock worm. [George F. Fisher, Plainfield, New Jersey, assignor to Morgan & Wright, Detroit, Michigan. United States patent No. 1,178,908.]

IMPROVED TUBING MACHINE HEAD FOR INSULATED WIRE. A tubing machine head is provided with a by-pass for the material so that the machine can be quickly put in running condition without disturbing the setting of the die. [Otto P. Houben, Akron, Ohio, assignor to The B. F. Goodrich Co., a corporation of New York. United States patent No. 1,180,399.]

VULCANIZING CONTINUOUS SHEETS. The sheets of unvulcanized rubber are passed between an upper and lower series of relatively staggered heating drums, and at the same time are dusted with talc to prevent adherence to the drums. [E. T. Fenwick, attorney, 600 F street, N. W., Washington, D. C. British patent No. 4,139 (1915).]

MACHINE FOR INLAID TILING OR SHEETING. The different sheets of rubber stock are passed around rollers equipped with dies, that cut out the pattern mosaics, which are then deposited on a suitable backing and the whole pressed and vulcanized. [E. T. Fenwick, attorney, 600 F street, N. W., Washington, D. C. British patent No. 4,140 (1915).] A similar machine was illustrated and described in THE INDIA RUBBER WORLD, June, 1915, and May, 1916.

DOUBLE SPREADING MACHINE. The fabric is proofed on one side and passed under the steam-heated table where the solvent is removed. It is then reversed, proofed on the other side and passed over the steam-heated table, which assists evaporation of the solvent. [A. Olier & Co., Clermont-Ferrand, France. British patent No. 8757 (1915).]

INDUSTRIAL TRUCK WHEELS. A solid tire construction adapted for use with small wheels, consisting of side plates bolted together, and an annular band of metal embedded in the rubber tire. [A. B. Williams & Co., Weaman street, Birmingham, England. British patent No. 11,165 (1915).]

COAGULATING LATEX WITHOUT CHEMICAL OR MECHANICAL AGENTS. This invention consists in pouring the undiluted latex into horizontally arranged shallow pans, forming a thin layer of uniform thickness by exposing the latex to sun and air. [Julius Schadt Medan, Sumatra. British patent No. 12,002 (1915).]

BEARING FOR WASHERS AND MILLS. These are mounted on the frames, without side pieces or brackets, and connected by bolts of such tensile strength as to give way under an unusual strain. [Deventer Ijgerietij en Machinefabrik and Reinout van

Volten, both of Deventer, The Netherlands. British patent No. 13,776 (1915).]

OTHER MACHINERY PATENTS.

THE UNITED STATES.

- 1,181,487. Repair vulcanizing device for rubber tires. J. B. Rasmussen, assignor to The Marvel Accessories Manufacturing Co., both at Cleveland, Ohio.
- 1,181,497. Repair vulcanizer. L. B. Brown, Waterville, N. Y.
- 1,182,199. Machine for molding tubes. W. Norris, assignor to the B. & R. Rubber Co., both of North Brookfield, Mass.
- 1,182,598. Apparatus for making hollow rubber articles. H. R. Strauss, Cleveland Heights, Ohio.
- 1,182,599. Apparatus for making hollow rubber articles. H. R. Strauss, Cleveland Heights, Ohio.
- 1,182,599. Cement applying machine. L. Mather, West Newton, Mass.
- 1,182,711. Tubing machine. V. Royle, Paterson, N. J.

THE DOMINION OF CANADA.

- 167,334. Tire building machine. Morgan & Wright, Detroit, Mich., assignee of T. Midgley, Lancaster, Ohio.
- 167,335. Tire building machine. Morgan & Wright, Detroit, Mich., assignee of T. Midgley, Lancaster, Ohio.
- 167,336. Tire building machine. Morgan & Wright, Detroit, Mich., assignee of T. Midgley, Lancaster, Ohio.
- 167,369. Vulcanizing apparatus. J. W. Arthur, Warren, Ohio.
- 167,480. Sheet sole vulcanizing and applying apparatus. C. F. B. Caldwell, West Newton, Mass.
- 167,412. An apparatus for making tire forming strips. J. T. Lister, Cleveland, Ohio.
- 167,711. Machine for plastic materials. The Consolidated Rubber Co., Limited, Montreal, Quebec, Canada; assignee of H. J. Hoyt, Detroit, Mich.
- 167,945. Vulcanizing apparatus. W. F. Stearns, Exeter, N. H.

THE UNITED KINGDOM.

- 24,087 (1914). Shitting and reaming machine. I. C. R. Marks, 57, Lincoln's Inn Fields, London.
- 24,580 (1914). Rolls to mixers and calendars. Miller & Co., and J. White, London Road Foundry, Edinburgh.
- 460 (1915). Embossing or molding india rubber. C. Woollett, 176 Rice Lane, Walton, Liverpool.
- 505 (1915). Machine for smoothing and polishing rubber. J. C. Prims, W. F. Smith, and Duplex Molding Sander Co., Hornell, N. Y.

NEW ZEALAND.

- 36,386. Tire cover or casing manufacture. The Dunlop Rubber Co., Limited, 14 Regent street, Westminster, England. (Assignees of Colin MacBeth, of Manor Mills, Salford street, Aston, Birmingham, Eng., works-manager.)

PROCESS PATENTS.

THE UNITED STATES.

- 1,182,071. Process of treating automobile tires and other like articles for separating the rubber and fabric. C. P. Bary, assignor to H. P. C. G. Debaugue, both of Paris, France.
- 1,182,200. Method of preparing strips of rubber for attachment to leather and the product. W. Norris, assignor to the B. & R. Rubber Co., both of North Brookfield, Mass.
- 1,182,308. Making tires with an embossed tread. G. J. Paynter, Philadelphia, Pa.

THE DOMINION OF CANADA.

- 167,046. Pneumatic tire assembling method. H. W. van Meeteren, assignor. A. Edwards and H. Headley, each an assignee of a third interest—all of Birmingham, Warwick, England.
- 167,481. Method of making convex or concave bodies of felt, etc. The Scholl Manufacturing Co., Incorporated, Chicago, Ill., assignee of D. W. Anderson, Stockwell, Indiana.
- 167,508. Composition for tires. J. Flint and G. Bolton, Five Dock, and W. A. McLauchlan, Sydney, co-inventors—both in New South Wales, Australia.
- 167,550. Process of making welt inner soles which consists in superimposing two sole shaped pieces, with a layer of gutta percha between. W. A. Knife, Ward Hill, Mass.

THE UNITED KINGDOM.

- 24,235 (1914). Vulcanization of rubber covered electric conductors. W. Geipel, 72a, St. Thomas street, Southwark, London.
- 24,829 (1914). Driving bands. E. E. Hodgkins, Grange Mills, Bermondsey, London.

THE FRENCH REPUBLIC.

- 478,705 (May 9, 1914). Process for manufacturing molded articles with holes from plastic material. A. Thibie.
- 478,907 (June 4, 1914). Insulating material and process for its manufacture. MacFarland and Shoemaker.

New Goods and Specialties

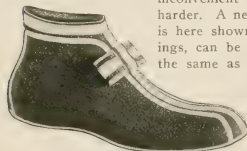
WILLIAMS' PATENT VIOLIN CHIN REST.

VOLINISTS frequently suffer from chafed and irritated skin on the chin, owing to the position in which they are obliged to hold their instruments. The advantage of a chin rest that will obviate this difficulty is self-evident, and this claim is made for the Williams' patent. This chin rest is made of soft rubber of good quality, not likely to harden with use. Its flexible quality allows freedom of motion without the friction that is the fundamental cause of sore chins. In use it requires but slight pressure to hold the violin in position. It is light in weight and the metal bars are unusually far apart, distributing the pressure on the ribs of the violin, thus avoiding the danger of cracking or otherwise injuring the instrument. It sets up well from the violin, rendering the use of a pad unnecessary in most cases. The top of the chin rest is easily detached and can be replaced at small cost. [Carl Fischer, New York City.]



THE "UNIKA FUTEIT" BATHING SHOE.

At many beaches it is necessary to protect the bather's feet against pebbles and rocks. Many bathing shoes used for this purpose are heavy and stiff-soled, and are not only inconvenient but make swimming the harder. A new style of bathing shoe is here shown which, having no laces, can be put on and off quickly the same as a stocking and will always stay on the feet. These shoes are very light weight, do not absorb water, and dry out quickly. The soles are of rubber and it is claimed will positively keep the wearer from slipping on a wet diving board, a heaving float, or slippery rocks. What will commend itself to the ladies is that this line of shoes is made in a number of handsome colors and combinations, to match or harmonize with the bathing suits and caps. They are supplied in low shoe and ankle heights. [United States Rubber Co., New York City.]



SCALLOPED FRUIT JAR RING.

The thin rubber ring that fits so snugly between the cover and the jar holding canned fruit, though a small affair, is an important feature in the preservation of the contents. As an article chosen solely for its utility little attempt has hitherto been made to beautify it. However, one has appeared upon the market having scalloped edges which add to its utility an attractiveness which may appeal to the feminine mind. When this ring is applied to the fruit jar and the cover is fastened down, the scallops form a frill beneath it; but, more important than this, the wider surface is claimed to afford additional security and protection. [Mechanical Rubber Co., Cleveland, Ohio.]



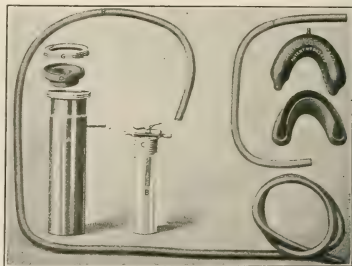
PIVOT SLEEVE GOLF COAT.

In the popular game of golf, absolutely free muscle and shoulder play is essential for an effective stroke. The ordinary coat sleeve cuts short the free swing of the arm by binding at the shoulder, and the special feature of the golf coat shown herewith is designed to eliminate this difficulty. Self-expanding plaits at the top of the sleeve allow unrestricted motion of the arm, adapting themselves to the various movements required, while in normal position the plaits are invisible. These coats are made of various sporting fabrics, including waterproofed cloths and rubberized textures. While specially designed for golf, they are excellently suited for use in trap shooting, motoring and general sporting wear. [Ph. Weinberg & Sons, New York City.]



IMPROVED DENTAL APPLIANCE.

An improvement in the invention [mentioned in THE INDIA RUBBER WORLD, September, 1914] for cleansing the mouth by vacuum drainage and for massaging the gums is illustrated here. Its use, by stimulating a full flow of blood to the tissues, it is claimed, is exceedingly beneficial in pyorrhea. It consists of an appliance of flexible rubber which fits comfortably over the jaw, with connections for inducing a partial vacuum when attached



to a water faucet. This is the invention of Dr. M. H. Cazier, who claims that its use will check the progress of the disease and with proper professional aid will result in complete recovery. The cylinder is attached to a water faucet by means of a rubber disk and screw cap, the force of the water regulating the amount of suction. There is a flask which receives the discharges during the treatment, this latter being provided with an alternating lever to regulate the action. The various parts are connected by rubber tubing. [The Sanitor Co., Chicago, Illinois.]

THE "NOWAY" RUBBER SHEETING.

Rubber sheeting manufactured under the name of "Noway" is claimed to be a perfect substitute and can be used for each and every purpose where oiled silk is now employed. It is a fine texture white fabric, of light weight, with a light coating of pure Para rubber and it is claimed to be thoroughly waterproof and antiseptic, and having superior tensile strength. It is well

adapted for hospital uses, for bed sheets, pillow cases, surgeons' aprons, etc., and is also especially recommended for first aid treatment to glove a cut member and as a cover for a bandage. [American Rubber Fabric Co., Pittsburgh, Pennsylvania.]

"CLEAR-SCOPE" AUTO WINDSHIELD CLEANER.

The annoyance and danger in driving an automobile in bad weather and not being able to see the road clearly is familiar to every motorist. A device to prevent clouding of the windshield from rain, fog or snow is here shown. It consists of two steel rods covered with rubber which are simply slipped over the top of the windshield, being provided with a handle which the driver grasps, sliding the rods back and forth and over the glass. One operation, it is claimed, cleans and dries the glass, presenting the absolutely clear surface necessary for safe driving. [The Zinke Co., Chicago, Illinois.]



ELASTIC HEAD BANDS.

The "Bike" elastic band here shown is intended to be worn by athletic sport enthusiasts of either sex, when indulging in their favorite exercise, for the purpose of keeping the hair in place and absorbing perspiration, that dims the vision of those players who wear glasses.



An elaboration of this band intended especially for the football player is also shown. It has straps going over the head and is worn low, covering the ears.

These bands are made of cotton thread interwoven with rubber-covered thread, which, in the case of the football headgear, affords protection for the ears without interfering with the hearing. They are supplied in three sizes—small, medium and large. [Sharp & Smith, Chicago, Illinois.]



"REALFLEX" ARMORED CONDUCTOR.

In electrical wiring in old buildings an armored wire is a practical necessity. It is difficult to secure the maximum of strength and at the same time the degree of flexibility needed. Again, the armor must be sufficiently smooth to be drawn between partitions and through small openings with a minimum of friction. It must be so finished that it will not injure the hands of the workmen while handling it. A piece of "Realflex" armored conductor is shown here, tied



in a double knot, thus practically illustrating its flexibility. The rubber-covered wire is completely protected by a heavily hot galvanized flexible steel wire, both rat proof and dust proof. This is wound about the conductor in a new and ingenious manner which gives this flexibility combined with maximum strength. A complete line of sizes is made, suiting all individual requirements. [The Western Conduit Co., Youngstown, Ohio.]

AN ARMY SANDAL.

The Canadian troops going into active service in the field in Europe will certainly be well shod. The army sandal shown



here is the one officially adopted by the government. It is of tan colored rubber, specially designed to fit the heavy type of ankle leather boot which has been issued to the troops. The sole is of a coarse type, with extension heel lined with zero net, and a strong cotton reinforcement is placed inside the rubber at the heel and toe. Many thousand pairs of this special sandal have been ordered and duplicate orders have recently been received, thus showing their special adaptation for this heavy service. [Canadian Consolidated Rubber Co., Limited, Montreal, Canada.]

THE "FRUIN-TOBIN" RUBBER BAR HORSESHOE.

Every winter storm brings its quota of injured horses, owing to their inability to keep from slipping and falling on wet or icy pavements. There is no better preventive than

rubber, and this also serves as a cushion and relieves the jar caused by the hoof striking the pavement. The horse-shoe here shown is made of forged steel containing large channels at the heels and at the toe, into which rubber is vulcanized, extending across the heel and forming a bar. The sharp flange running from each side of the toe back to the quarters is an exclusive feature, and the width of the frame at the heel prevents pressure, therefore eliminating heel trouble. The shoe can be concaved to fit a drop sole foot and is said to be a positive cure for corns. Owing to the drop forged frame, it can be shaped to fit the hoof without heating. It will spread one-quarter of an inch, and is punched so that it can be nailed on securely and easily. [Fruin Drop Forge Co., Chicago, Illinois.]



TYPEWRITER CUSHION FEET WITH DOUBLE CAVITY.

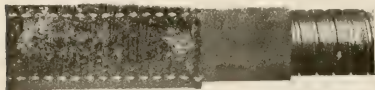
The device here shown was adopted as most satisfactory by its inventor and manufacturer after detailed experimentation with other forms of support for the typewriter, such as built-up



felt pads, a flat metal spring, sponge rubber, and other devices. These cushions are made of solid rubber so shaped as to be easily slipped over the feet of the machine. An exclusive feature is the double cavity. The upper cavity receives the foot of the machine, while the lower tends to create a vacuum under the typewriter and prevents it from creeping. The upper illustration shows the cushion in proper position. The lower gives a view of the bottom, showing the vacuum cavity, also a slight depression of the rim, which further serves the purpose. The use of these rubber feet is claimed to reduce the noise of operating about one-half, also giving a spring to the key action and softening the touch on account of their resiliency. By absorbing the shock, the nerves and strength of the operator are conserved, also wear and tear on the machine. [H. C. Nielson, Chicago, Illinois.]

METAL AND RUBBER HOSE FOR GASOLENE.

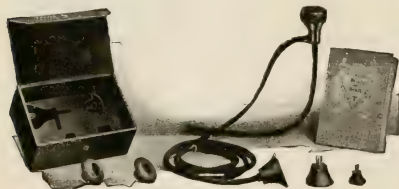
Rubber hose has its disadvantages when used to convey gasoline, for that volatile liquid is a solvent of rubber and causes rapid deterioration. A metal hose is better adapted for such purpose, but such a hose is hard to handle, and much trouble is apt to appear because of the difficulty in preventing leakage at the joints. A hose which is claimed to combine the advantages of both metal and rubber is here shown. The basis is a very flexible, smooth-bore metal tubing made tight by means of an



asbestos cord packing. This lining keeps the gasoline from coming in contact with the rubber tube which is vulcanized over it. The rubber tube is of special gasoline-resisting composition specified by the Underwriters' Laboratories. Outside of this is a heavy, woven cotton jacket to protect it from external wear. Couplings furnished with this are attached in such a manner that they will not leak nor pull off. Four sizes are carried, $\frac{1}{2}$, $\frac{3}{4}$ and $1\frac{1}{4}$ inch, and these are made in any desired lengths up to 50 feet. [American Metal Hose Co., Waterbury, Conn.]

CLEAN-O-PORE VACUUM MASSAGE OUTFIT.

This massaging device has many apparent advantages. It costs nothing to operate. No electricity is needed, and there are no wires or motor to get out of order. The outfit consists of rubber washer connections for round or oval faucets, three rubber



suction cups of varying sizes for body and face massage, seven feet of rubber tubing, a nickel-plated vacuum chamber, and a book of instructions, all arranged in a compact leather-covered box. To operate, attach to a wash basin faucet and turn on the water. A gentle suction is created, which increases in strength as the pressure of the water is increased. The massage cup can then be moved over the face or any part of the body desired, stimulating the blood vessels, opening the pores and drawing out waste matter. It is recommended for use after shaving, for the relief of muscular soreness, for bust development and scalp invigoration. Also, when applied to the spinal column, it is claimed to relieve nervousness. [The White Swan Manufacturing Co., New York City.]

SPORTSMEN'S ENGRAVED GARTER.

The customary clasp for men's garters is apt to slip or become unfastened if the wearer is indulging in active exercise, causing embarrassment and annoyance. A new form of fastening has been devised which is claimed to eliminate this possibility. The lower end of a narrow metal plate or strip is equipped with small beveled teeth which grip the hose securely and are claimed not to injure the finest hose. The elastic band fitting about the leg can be readily disengaged from the metal clasp for renewal, and the garter may

be put on or taken off in considerably less time than is usually required for that operation. These garters are also being produced with gold and silver bands, in place of other metal, to be engraved with the wearer's name, this valuable and distinctive style offering a good field for gift sets. [Whitely Exerciser Co., New York City.]

VACUUM BREATHING APPARATUS.

The purpose of the apparatus here shown is to increase the breathing capacity of the user and it is especially recommended for bronchial affections such as asthma, hay fever and similar disorders. The patient places a rubber hood over his nose and mouth so that all air reaching him must be drawn through the rubber tubing. This tubing is connected with a glass containing



water, which is permeated by air obtained through another independent opening. The patient is forced to draw the air he breathes through the water, or against an approximate pressure of six pounds, causing him to breathe deeply and vigorously. The pull of the vacuum apparatus operated by motor, connected through a second tubing with the breathing hood, facilitates exhalation. A mercurial register shows the lung energy expended. [Sanitarium Equipment Co., Battle Creek, Michigan.]

SOMETHING NEW IN GOLF TEES.

Every golfer recognizes the inconvenience and annoyance of building up tees with sand which may have lain in the boxes for weeks exposed to the weather. Such players will appreciate



the Soluble Golf Tee, for which is claimed several special advantages. It affords a constant height for the ball from the ground, eliminates the guesswork, always present when teeing with wet sand. It is so light that it offers a minimum resistance to

the sweep of the club in a "follow through," thus improving playing. This tee is made of gelatin, and if left upon the ground does not litter up as would a paper tee, but dissolves from the action of the weather and disappears. It is more durable than a paper tee and can be used over and over again. It cannot injure the club and if lost it costs so little no time need be wasted in hunting for it. These tees are made up in $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{3}{4}$ inch heights, packed in neat boxes containing 100, or in boxes of 18, as may be desired. It is claimed that a box of 100 will last the average golfer an entire season. [The Pittsburg Golf Tee Co., Wilkinsburg, Pennsylvania.]

The Editor's Book Table.

PHYSIOLOGICAL PRINCIPLES FOR DETERMINING THE VALUE of the Various Rubber Tapping Methods. By Professor Dr. Hans Fitting (translated by J. H. Reuter). Copper & Sons, of "Times of Ceylon," office 27 Mincing Lane, both London, E. C., England. [Paper, Rev., 31 pages.]

THE rubber planter is interested in bringing his plantation quickly into a profitable condition as a commercial enterprise and maintaining it in that state as long as possible. Doctor Hans Fitting has made a very careful study of the many questions involved and has indicated the way to be followed in investigating practical methods of tapping.

After explaining the functions of the root, stem and crown, the circulation of water, and showing that the ascending movement of water and the inorganic salts takes place in the wood, and the descending movement of the organic substances, chiefly in the bast, he reports the result of his experiments. Believing with Kneip that in all probability latex is not a nutrient juice, and, consequently, is of no importance as regards the circulation of the sap, he assumes that the latex is produced almost entirely, in the stem, however, it is also found to a small extent in the leaves, and therefore the nutritive substances required for this purpose must exist in the stem in sufficient quantities. If there is a deficiency of them, the renewal of latex must necessarily suffer and the supplementary latex may possibly deteriorate in quality.

It may be concluded that in rubber trees cuts made very deep in the cortex and in the bast disturb some very important vital functions of the tree. As the lactiferous vessels are situated chiefly in the bast, tapping should penetrate to the inner parts of the bast in order to secure a sufficient flow of sap, but must neither reach nor cut through the cambium.

Dr. Fitting's first tapping experiment was a spiral incision one and one-half times around the tree. This had the same effect as girdling because the circulation of organic nutrients in an oblique direction proceeds too slowly to provide the food supply required by the base of the tree. The tree is, therefore, obliged to draw on the reserve material from its reservoirs in the bark and wood.

In the second experiment the tapping cuts extended only over a quarter of the stem's circumference. There were six tapping areas, with bridges of bark between each. On three of these areas, the Bowman parer alone was used, and on the alternate three, the Bowman parer and Bowman pricker. The tapping period extended from November 8 to April 11. The tree was then cut down and examination showed that tapping cuts of this description can at most have only a local influence on the descent of organic food substances toward the base.

In the case of young trees, planters are warned against the use of all those tapping cuts by which the rectilinear connection of the vertical channels for the circulation of organic substances in the cortex and bast suffer a complete, or almost complete, interruption at any spot between the crown and the base of the tree.

Therefore, the spiral cut should be rejected, not because a great quantity of bark is in course of time removed from the tree, but because it completely destroys the food channels. Also, all those tapping methods are unsuitable, by means of which straight strips of bark are at first left between incisions and are removed in the second tapping period. Lastly, it is advisable to avoid all tapping methods, where the incisions are of such length that the nutrient and constructive substances within the tapping system must

travel too great a distance in an oblique or even horizontal direction.

In reviewing the value of tapping methods, the demands of practice must be considered, namely, that the latex should run easily and be easily collected, and the incisions be easily made. The herringbone incision must be given preference, here, as long as it embraces only a small part of the tree's circumference. The tapping system should extend only over a quarter of the tree's circumference. Successive tapping periods are to be confined respectively to the second, third and fourth quarters. Preference should be given to the half herringbone incision because of the short channels for flow of the latex.

The use of the pricker, as a tapping tool, cannot be recommended. Wherever the teeth of the pricker penetrate to the neighborhood of the cambium, the latter forms a new bark with many stone cells, but practically without lactiferous vessels. Where the pricker teeth did not penetrate through the inner cortex, new bark formed containing lactiferous vessels arranged irregularly. Bark on the tapping spots is renewed much more evenly if the knife is used exclusively, and is sooner ready for re-tapping.

The author's conclusions are summed up thus: "Do not begin to tap the trees till they are six or eight years old and are twenty inches in circumference, at three feet from the ground. Adopt the half, or the full herringbone V-shaped incision. Angle of sixty degrees is best. The tapping system must cover only a vertical strip of bark not exceeding a quarter of the tree's circumference. Tap daily, or on alternate days, with knife only. Prolong the tapping to five or six months. Avoid mixing latex of different quality, that from young and old trees, or from trees at different stages of tapping.

"It will be found advantageous to tap for two or three months, removing at most half the strips of bark between two incisions; after that pause for one or two months and then finish tapping the remainder of the bark in two or three months."

GREEN BOOK FOR BUYERS. PUBLISHED BY THE OIL, PAINT & Drug Reporter, New York City. 16mo., 206 pages. Paper bound. Price, \$1.00.]

This is a semi-annual publication, a guide for buyers of all sorts of oils, paints and drugs, being really a directory of manufacturers and dealers in these lines, arranged under the headings of the materials manufactured and sold. The book is a very small one, can be conveniently carried in the breast pocket, and seems very full and complete in every particular that would make it of use to heads of purchasing departments in all factories using oils and chemicals.

THE MEDICAL WHO'S WHO, 1916. THE FULTON-MANDERS PUBLISHING CO., London, England. 16mo., 1,140 pages. Price, 10s. 6d.]

The many members of the rubber trade who know A. Staines Manders and his able secretary, Miss D. Fulton, may be aware of the fact that the Fulton-Manders Publishing Co., of London, is publishing a number of important works concerning the medical profession and other lines, including several in the rubber field. The latest publication of this company is the one named above, a compact volume containing an immense amount of information regarding the medical profession of the United Kingdom. Brief biographies are given of the many thousand physicians. There are

also lists of those who have died in the preceding year; a general index of the towns with the names of the practitioners who live in each, and a brief mention of the medical periodicals published in the Kingdom. In all it is a book which must be of great value to those in or interested in the medical profession. We congratulate Mr. Manders on bringing out so complete a book, one showing care in compilation and excellent judgment in arrangement and publication.

NEW TRADE PUBLICATIONS.

GUTTA PERCHA & RUBBER, LIMITED, Toronto, Canada, is sending out a neat little pamphlet describing the "Maltese Cross" tires. The book is handsomely printed, the illustrations being especially clean, clear and distinct, and giving a very realistic idea of the tires, inner tubes, patches, rubber mats and other automobile accessories manufactured by this company. Each page is printed with a tinted background, which adds particular brightness to the illustrations, and the whole mechanical arrangement is most commendable.

The Link-Belt Co., Chicago, Illinois, in a compact little booklet describes and pictures the various forms of belt conveyors for handling separate pieces or packages from floor to floor or from one part of a factory to another. These various forms are pictured and described in such a manner as to give a very clear idea of their arrangement and appearance. The pictures show conveyors carrying such things as loaves of bread, or even ink bottles, while others are shown moving raw material, printed matter, trays of bottles, boxed and other goods, as well as barrels, loose packages, bales of various substances and similar articles. There is hardly a manufacturing establishment of any large extent in the United States which could not find use for one or another of such conveyors, and managers of industrial establishments might well read this little book with profit.

The B. F. Goodrich Co., Akron, Ohio, has published a wall calendar for the 12 months following April 1, 1916, which is likely to find space in many offices. Like all the Goodrich advertising, it is attractive, and this particularly so, being mainly a large lithograph of a crossing policeman escorting a daintily dressed little miss of perhaps ten years across the street while holding up traffic for the purpose. The aristocratic step of the little girl and the appreciative smile upon the face of the policeman make the picture especially noticeable. It is the work of Peter Newell, the well-known artist. A series of monthly leaflets forms the calendar portion, with bold, strong figures easily read from a distance.

The Racine Rubber Co., Racine, Wisconsin, has published a very attractive booklet entitled "The How and Why of Racine Tires," which gives a well written story of the factory, the method of manufacture and the kinds of tires manufactured by this concern, together with hints of value to users of these tires. The pamphlet is printed in two colors, has a bird's-eye view of the factory and many illustrations of the various departments, as well as of the tires, patches, reliners, casing boots, etc., manufactured by this enterprising company.

We have recently received a copy of the India-Rubber, Gutta-Percha & Electrical Trades Diary and Year Book for 1916, published by McLaren & Sons, Limited, London, England. This is the regular edition of the convenient desk book which has been published by this firm for a number of years and which contains a large amount of statistical

matter and useful information of the British rubber trade besides the regular diary pages, which are so arranged as to give a liberal amount of room for accounts of daily transactions of the busy rubber man. In former editions these pages have been interleaved with blotting paper, the absence of which is in part made up this year by the insertion of several loose sheets of this material. The trade index comprises a long list of importers, brokers and rubber manufacturers throughout Great Britain and also information regarding export duties from rubber producing countries and other useful facts in convenient form for quick reference.

The National Fire Protection Association, Boston, Massachusetts, has printed a special pamphlet fully describing the sweeping fire in the residential section of Nashville, Tennessee, on March 22, at which there was an estimated property loss of \$1,500,000. It gives a panoramic reproduction of a photograph of the burned district nearly four feet long and shows what havoc the fire wrought. It also gives a map of the burned section showing area and extent of the fire. A similar booklet describes a \$10,000,000 fire in Paris, Texas, last March which resulted in a destruction of 1,440 buildings. In each case the conclusion is that, if sweeping fires in American cities are to be avoided, light frame construction and especially shingle roofs must be eliminated, and the recommendation is that there should be a legal abolition of the shingle roof and encouragement of that type of building construction which resists fire. This is a point well worth the consideration of those manufacturers who are erecting buildings for their plants or for their employees.

The board of directors of the Underwriters' Laboratories, Chicago, Illinois, under date of March 16, sent out their annual report, which shows the assets and liabilities, recommendation for the annual appropriation, and by-laws adopted. These items are followed by a statement descriptive of the organization, its purposes and methods, which portion of the book is illustrated with fine half-tone engravings of the building and various departments, thus giving a good idea of the thoroughness of the equipment for the purposes designed. In the latter portion of the book is shown in fac simile, printed in several colors, the many labels which are furnished by this corporation as guarantees of efficiency of the many machines, accessories, etc., which are examined and recommended by this establishment.

BALLOON FABRIC PATENTS.

German patent, No. 283,760, of September 9, 1913, was granted to Walter Seyd and Paul Benrath, both of Barmen, Germany, for a new balloon fabric made of a knitted textile having a rough surface instead of the ordinary smooth surface of woven balloon materials. This new fabric is said to be very strong, flexible and not easily torn. It is further stated that it can be used for covering the sustaining surfaces of aeroplanes as well as for making up balloon bags. It can be made of silk, cotton or any other textile, in any color, and it can be produced in large quantities at a low cost. It is especially easy to impregnate the new fabric with balata, which gives it great strength and makes it perfectly gas-proof.

German patent, No. 283,437, of January 11, 1913, to Metzeler & Co., of Munich, Bavaria, is for a process for building the hulls of airships from a material composed of several layers of fabric assembled in such a manner that the diagonally running warp threads of one layer cross the corresponding threads of the next layer of fabric, the strips of fabric being composed of a consecutive series of panels whose warp and weft threads cross one another.

The Obituary Record.

A THOROUGH RUBBER MAN.

L E BARON C. COLT, vice-president and general manager of the National India Rubber Co., Bristol, Rhode Island, died at his home in that town May 25, the result of a motor accident described in the Rhode Island letter, printed on another page in this issue.

He was born February 27, 1877, at Bristol, the only son of United States Senator Le Baron B. Colt and Mary Louise (Ledyard).



LE BARON C. COLT.

Colt. After attending the public schools he entered Brown University, and on his graduation from that institution, entered the employ of the National India Rubber Co. as an apprentice, learning the business thoroughly by practical experience, working successively in the cloth room, the mill room, the cutting room, the making room, the heater room. In each he began at the bottom, and learned the work as did any apprentice. He was appointed assistant superintendent, which gave him time for laboratory and experimental work,

for which line he developed unusual fitness. Then he became traveling salesman, and in 1904 he was selected as resident manager.

At that time the Bristol plant was a somewhat heterogeneous aggregation of buildings with considerable antiquated machinery. Rearrangement, consolidation, new buildings and equipment characterized his management, and the business developed from a maximum number of people on the pay roll of 1,700 to 3,300, and the output of shoes from 18,000 pairs to 44,000 pairs per day, and the insulated wire business from 60,000 to over 200,000 feet per day.

He was particularly careful about the health and welfare of his employees, and devoted considerable of his energy to bettering hygienic conditions in his plant. About three years ago he built a hospital for the better care of the workers, and personally organized it. As a result of his efforts on behalf of his operatives and his ability to cooperate understandingly with them he was held in high regard.

In 1904 he married Miss Joujou Edith Converse, daughter of the late Admiral George A. Converse, who, with three children survives him.

Mr. Colt possessed to a remarkable degree qualities of successful leadership. The son of a judge of the United States Court, and a nephew of Colonel Samuel B. Colt, president of the United States Rubber Co., he combined in a remarkable manner the judicial instinct of the one and the far-sighted business acumen of the other. He had the thorough loyalty of those who worked under him, the warm personal friendship of his business associates and the unbounded confidence of all with whom he came in close business contact. He will be mourned by a wide circle of friends.

CHEMIST, ORGANIZER AND EXECUTIVE.

In the death of E. H. Pound of the Holland American Plantation Company, the United States Rubber Co. has lost one of its most valuable workers.

Edward Harold Pound was born at Pontiac, Michigan, April 12, 1886. Shortly after graduating from the high school, he went to Mexico on the railway survey for the Mazatlan Extension



E. H. POUND.

from Durango to the Pacific Coast. Returning in 1907, he entered the University of Michigan School of Forestry. During part of his time there, he acted as assistant in forest botany, and the summer of 1909 he spent in the U. S. Forest Service in Montana. In 1910 he left the University of Michigan to enter the employ of The Rubber Exploration Co., taking charge of the forestry and botanical ends of two extended exploration trips in South

America. In 1912 he entered McGill University, Montreal, to take up work in organic chemistry, specializing in biological chemistry, with particular reference to rubber, and graduated with the degree of B.Sc. in 1913.

Mr. Pound entered the service of the United States Rubber Co. on June 17, 1913, and after a year in charge of the crude rubber division of its general laboratories in New York, was selected by this company for the important post of director of the technical department of the Holland American Plantation Co., which operates its eastern plantations. In April, 1914, he left for his new position in Sumatra to undertake the task of organizing and conducting experimental work on a large scale on the important problems involved in the production of plantation rubber.

Mr. Pound's thorough training, an unusual experience, together with his good business sense and unbounded energy and enthusiasm, made his work a success from the beginning. His ability as a judge of men, and as an organizer and executive is shown by the excellence of the technical staff which he gathered around him, and by the smoothness with which this organization was able to carry on its work when Mr. Pound was forced to be absent on business, and later on account of ill health. In December, 1915, he was obliged to leave his work at Sumatra for a rest trip in China and the Philippine Islands. His health, however, failed to improve and he died on January 21, 1916, in Hong Kong.

Mr. Pound's breadth of vision and keen technical judgment have left a mark on the rubber industry of the East, and have resulted in a degree of achievement which most men would be proud of reaching at the end of a long business career. His death is a distinct loss to the rubber industry, to the company which employed him, and to the associates whose love and loyalty he won by his rare personal charm and uncommon breadth of nobility and character.

A PIONEER ELASTIC WEB MAKER.

William Rapp, one of the best known men in the field of elastic web manufacturing in this country died, at his home in Brockton, Massachusetts, May 19, aged 82 years.

Mr. Rapp was born in Staffordshire, England, in 1833. His father died two years later. There were no free schools there, and the boy received but scant education. At an early age he went to work in a webbing factory and by diligence and industry rose to the position of foreman and later established himself in the business in Leicester. In 1881, his factory was burned down, and he decided to come to America. Locating in Chelsea, Massachusetts, he joined forces with William and Thomas Martin, and formed the Elastic Gusset Co. Two years later, he formed a partnership with Albert Herbert, and built a webbing factory at Brockton, Massachusetts. This concern later became the Hub Gore Makers, with factories in Brockton, Rockland and Chelsea, Massachusetts, Bridgeport, Connecticut, and Camden, New Jersey, and is now a part of the more recently formed concern "Everlastik, Inc."

Mr. Rapp made his home in Brockton, and for many years supervised the work at the factory in that city. He served as a councilman in 1890, 1895 and 1896. He was a member of the Commercial Club, and a prominent member of the Porter Congregational church.

His wife died a few years ago. He is survived by a son, eight grand-children and four great-grand-children.

AN ABLE EXECUTIVE.

Aaron D. Weber, vice-president and general manager of the Canadian Consolidated Felt Co., Limited, died at his residence in Berlin, Ontario, Canada, May 7, at the age of 43 years. He was born on a farm near Berlin in 1873. In 1900 he started work as a shoemaker in the Berlin rubber factory. The following year he became a traveling salesman. When the Merchants Rubber Co. was founded in 1903 he joined that organization, and after the company passed under the control of the Canadian Consolidated Rubber Co., Limited, he served successively as assistant manager of the Merchants factory, manager of the footwear department at the Toronto branch, manager of rubber footwear production and sales at Montreal, general manager of the Canadian Consolidated Felt Co. at Berlin, and vice-president of the company.

Mr. Weber's career is a splendid example of what ambition and will-power can accomplish for a young man. Sixteen years ago he started as shoemaker in a rubber factory and at his death was vice-president and general manager of one of Canada's great industries.

His death is a distinct loss to the city of which he was a worthy citizen, and to the industry of which he was general manager. He is survived by his widow, father, sister, and two brothers.

ORPHAN BRANDS NOT REGISTRABLE IN AUSTRALIA.

A trade-mark decision of interest to those who are dealing with Australia is that recently announced in the matter of the National India Rubber Co., Bristol, Rhode Island, which made application to register the words "Empire Rubber Co." as a trade-mark for boots and shoes. There were several reasons why the application was not allowed, one being that it was printed in ordinary script and not displayed in a distinctive manner, another because the word "Empire," which is the principal feature of the trade-mark, was anticipated by prior registrations for the same kind of goods. But the added reason, and the one most important as coming within the provisions of the Australian trade-marks act, was that it was not the name of a company, individual or firm actually in existence and the law officer held that the use of the words "Empire Rubber Co." would amount to a representation that the goods were manufactured, packed

or marketed by a company of that name when, as a matter of fact, they were not. It was also contended that the word "Empire" when used in a British possession would *prima facie* convey a reference to the British Empire and lead British subjects to believe that the goods were the product of a British company. Consequently, the use of the mark on the goods of the applicant would amount to a false trade description.

STANDARDIZATION OF HOSE COUPLINGS.

The Hose Coupling Committee of the National Fire Protective Association, in its report to that body at Chicago, states that there is an encouraging growth in the movement toward the general adoption of national standard hose couplings in order to secure reliable and efficient service in cooperation between fire departments of neighboring communities. It particularly praised the activities of the Ohio State Fire Prevention Association in its work of standardizing of hose couplings and fire department equipment in cities within 55 miles of Columbus, while similar work is in progress in and adjacent to other large cities in that State. New editions of "Hose Coupling Specifications" and "Couplings Record" have been printed. The latter shows a list of 2,222 towns, the equipments of which 894 are standard, and 1,328 adaptable. The committee, which consists of Howard L. Stanton, Norwich, Connecticut; H. C. Henley, St. Louis, Missouri; George E. Bruen and F. M. Griswold, New York City, suggests that the committee be enlarged by the creation of sub-committees selected from the membership of each State Fire Association, whose duty shall be to collate hose couplings and hydrant data for record, to urge the adoption of the standard and to foster cooperation between communities, and that the N. F. P. A. select one or more of its members to attend the conventions of the State Fire Marshals' Association to urge such cooperation and standardization.

ANOTHER SCHOLARSHIP IN CHEMICAL ENGINEERING.

In our May issue a brief announcement was made of the establishment of a scholarship fund endowed by Dr. Victor G. Bloede, of Baltimore, Maryland, the income of which, approximately \$500 a year, is to be devoted to financially assisting deserving young men to obtain an education in the field of industrial chemistry or chemical engineering, at any institution in the United States which may be designated or approved by the Chemists' Club of New York City. This club has since announced the establishment of another scholarship fund, the income of which, approximately \$400 a year, is to be devoted to the same purpose. This scholarship has been endowed by William F. Hoffmann, president of the American Oil & Supply Co., Newark, New Jersey, and one of the founders of the Chemists' Club of New York. The benefits of both these funds will be open to properly qualified applicants without restriction as to residence, and may be effective at any institutions in the United States which may be designated or approved by the Chemists' Club. The qualifications and full particulars regarding these scholarships can be obtained by addressing the Bloede Scholarship Committee and the Hoffmann Scholarship Committee of the Chemists' Club, 50 East 41st street, New York City.

THE STORAGE OF RUBBER GOODS.

An anonymous writer in "Gummi-Zeitung" states that light, high and low temperature, and moisture tend to shorten the life of rubber goods. Blue and violet light rays are particularly harmful. Red light is practically without effect. He claims that the color of goods seems to have some influence, bright colors acting in some degree as preservatives, and that sulphur bloom may have a certain protective effect.

The New York Preparedness Parade.

THE parade in New York City on May 13, of over 125,000 citizens was a wonderful demonstration of the stand taken by representatives of leading trades and professions on the question of preparedness for national defense. The rubber trade, as has been the case on similar occasions, was amply represented, there being by actual count, 2,415 rubber men in the procession.

Great credit must be given the committee in charge, H. G. Cleveland, W. G. Ryckman and H. S. Vorhis, upon whom fell most of the details and arrangements, and the result proved the thoroughness with which these duties were performed.

The military direction was under the command of Amedee Spadone, who had as his aids, H. H. Barnard, H. G. Cleveland, S. T. Hodgman, W. G.

Ryckman, T. A. Aspell and H. S. Vorhis. Captain Spadone was chosen as marshal of this division because of his training in the New York National Guard. His insignia of office was a handsome blue sash, the aids being distinguished by yellow silk sashes. The 2,400 marchers wore straw hats and each carried an American flag. On the coat of each was a medal of oxidized

silver and celluloid, showing two American flags, attached by a blue ribbon which read: "Rubber Division. Citizens' Preparedness Parade. May 13, 1916." A gorgeous banner of purple silk, with cloth of gold border, fringes and tassels, read: "The Rubber Industry of America," and was adorned with the seal of The Rubber Club of America, Inc.

The Rubber Division consisted of five regiments, each wearing a distinguishing color; the first regiment, under Colonel R. C. Fisher, red; the second, under Colonel Jackson, blue; the third, under Colonel M. Charles Schweinert, green; the fourth, under Colonel J. R. Parker, brown; and the fifth, under Colonel William E. Bruin, yellow.

Various rubber houses were represented by large delegations, the United States Rubber Co. heading the list with 884 men, all of whom wore straw hats, the bands of blue and white ribbon being emblazoned with the circular monogram trade-mark of the company. A. Schraders' Sons, Inc., were represented by 472 men; The B. F. Goodrich Co. by 104; Ajax Rubber Co., 109; New Jersey Car Spring & Rubber Co., 70; American Hard Rubber Co., 60; Kelly-Springfield Tire Co., 49; Hodgman Rubber Co., 46; Firestone Tire & Rubber Co., 40; while those which furnished one or two files of representatives included:

Parker, Stearns & Co., Goodyear Tire & Rubber Co., L. Littlejohn & Co., Core & Herbert, Obalski & Sweeney, Inc., Henderson & Korn, Consolidated Stamp Co., Republic Rubber Co., Okonite Co., H. Muehlstein & Co., Arnold & Zeiss, F. H. Cone, Vulcanized Rubber Co., Gutta Percha & Rubber Manufacturing Co., New York Mackintosh Co.

It would seem that every rubber house having its headquarters or branch offices in New York City was anxious to be repre-



AMEDEE SPADONE, MARSHAL.



RUBBER DIVISION OF THE PREPAREDNESS PARADE PASSING THE NEW YORK PUBLIC LIBRARY

sented, and besides those mentioned above, the following were represented among the marchers:

Mohawk Rubber Co., Tyler Rubber Co., New York Insulated Wire Co., Oxford Tripoli Co., Gibney Tire & Rubber Co., Falls Rubber Co., Knight Tire & Rubber Co., R. J. Caldwell & Co., Continental Rubber Works, Thomas Malone, C. W. Niles, Rolle Rubber Co., U-Glu Supply Co., Edward Maurer & Co., Charles Rubber Co. of New York, W. H. Stiles, W. G. Ryckman, Aldens' Rubber Co., Elkhart Bros., Pennsylvania Rubber Co., Combination Rubber Co., Empire Rubber & Tire Co., Rex Rubber & Novelty Co., Davol Rubber Co., Seamless Rubber Co., Canton Rubber Co., Miller Rubber Co., Miller Tire Corporation, Boston Woven Hose & Rubber Co., Meyer & Brown, Boston Belting Co., F. B. Ross & Co., A. Beers, Condensite Co., R. J. Pierce, Ritchie Ryan Rubber Works, Gould Commercial Co., Continental Rubber Co. of New York, W. H. Stiles, W. G. Ryckman, Aldens' Successors, Limited, Earle Bros., W. Hammesfahr & Co., Robert Badenhop Co., Inc., Chas. E. Wood, Richard Wohlberg, Rubber Trading Co., Pell & Dumont, Fred Stern & Co., A. V. W. Tallman, A. B. McNamara, Robinson & Co., Paul Bertuch, Eastmond & Co., Alcock Manufacturing Co., Jacob Blyn, U. S. Rubber Reclaiming Co., Inc., Converse Rubber Shoe Co., Raw Products Co., New York Rubber Co. and THE INDIA RUBBER WORLD.

The Rubber Division had the place of honor at the head of the trade section of the procession, immediately following the Municipal Departments. The trade was further honored in that George B. Hodgman, Van Henry Cartmell and H. Stuart Hotchkiss were chosen to escort the Mayor to the grand reviewing stand. The music for the Rubber Division was furnished by the First Regiment Band of New Jersey, 36 pieces; the band of the Mission of Immaculate Virgin, Staten Island and Manhattan, 70 pieces, and the Oriental Fife and Drum Corps of Stamford, Connecticut, 21 pieces.

It must be acknowledged that the fine marching of the rubber men aroused the plaudits of the half million onlookers who lined the entire route of the procession. All the marchers reached Fifty-seventh street at the end of the parade in fine condition, well satisfied that the rubber trade had done its full duty in showing its stand upon this important national question.

Captain Spadone has received from Colonel Sherrill, the grand marshal of the parade, a letter of thanks and appreciation for the splendid showing made by the Rubber Club. The letter closes as follows:

The pleasantest memory of my life will always be my service with you in this work, and I shall always remember you with affectionate regard.

You will please convey to your command my warmest thanks and heartiest congratulations for their splendid cooperation in our patriotic crusade.

The premises of the Gutta Percha & Rubber Manufacturing Co., on Duane street, were used as the headquarters and rendezvous for the Rubber Division, and in appreciation of this there has been presented to the company a beautiful silver loving cup bearing this inscription:

The Gutta Percha & Rubber Manufacturing Co., from the rubber trade of New York and vicinity in appreciation of courtesies extended in connection with the Citizens' Preparedness Parade, May 13, 1916.

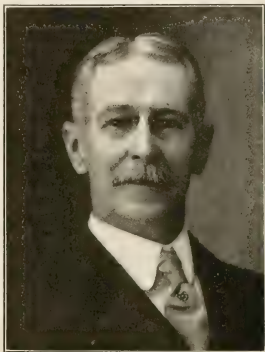
This cup, we understand, will grace Mr. Spadone's office, as a reminder, for all time, of this occasion.



SILVER CUP PRESENTED GUTTA PERCHA & RUBBER CO.

BOSTON'S PREPAREDNESS PARADE.

NEW YORK CITY'S great popular demonstration for preparedness set Boston an example worthy of emulation, and the latter city held a similar parade on Saturday, May 27, when between 50,000 and 75,000 citizens marched to show their sentiments on this question of the hour. This was in many respects similar to the Sound Money parade of 1896, but far exceeded it in the number of marchers.



MAJOR H. P. BALLARD, MARSHAL, RUBBER TRADE DIVISION, BOSTON PREPAREDNESS PARADE.

Woven Hose & Rubber Co.; Fred C. Hood, of Hood Rubber Co.; Ira A. Burnham, of American Rubber Co.; M. M. Converse, of Converse Rubber Shoe Co.; W. E. Piper, of Boston Rubber Shoe Co., and H. L. Williamson.

Assistant marshals of the division were P. R. Browne and H. H. Nance, of American Rubber Co.; E. H. Kidder, of United States Tire Co.; J. H. Learned, of Revere Rubber Co.; E. L. Phipps, of Boston Rubber Shoe Co.; J. W. Fellows, of Boston Woven Hose and Rubber Co.; Hugh Bullock, of Converse Rubber Shoe Co., and C. H. Peckham, of Boston Belting Co.

The rubber men rallied well, there being a total of 1,570 enrolled. Unfortunately, this division was given a position so far back in the line of march that it did not start in the parade until after 4 o'clock, a fact which undoubtedly prevented a much larger number of marchers. The houses represented included Boston Woven Hose & Rubber Co., Boston Belting Co., Converse Rubber Shoe Co., Hood Rubber Co., American Rubber Co., United States Rubber Co. of New England, Revere Rubber Co., Boston Rubber Shoe Co., Peerless Rubber Manufacturing Co., New York Belting & Packing Co., United States Tire Co., The B. F. Goodrich Co., Goodyear Tire & Rubber Co., Firestone Tire & Rubber Co., Kelly-Springfield Tire Co., Fisk Rubber Co., C. J. Bailey & Co., Republic Rubber Co., and Empire Tire & Rubber Co.

If numerically this division did not equal some of the others, it was no whit secondary to any other trade in soldierly bearing, fine marching and in enthusiasm. Major Ballard may well be proud as well as all who participated, of the representation of the rubber trade in this greatest popular parade Boston has seen in twenty years.

CHICAGO'S PARADE.

Chicago, following New York and Boston's example, will have a parade on Saturday, June 3. We are informed that the rubber trade will be well represented.

News of the American Rubber Trade.

JOHN ACKEN.

ONE of the pioneer concerns in the rubber business is the New York Rubber Co., which had its beginning back in 1858. At that time William H. Acken and John P. Rider came together and built up the company that has, for half a century, been acknowledged as one of the most stable, conservative and reliable of all of those which make rubber goods.

The senior Acken was president for many years and was succeeded, in time, by his son, John Acken. The present head of the company, like his father, is averse to publicity and is quite content to go his way unheralded as long as his business prospers and he lives up to the family traditions.



JOHN ACKEN.

Mr. Acken is a resident of Nyack, New York, where as an evidence of public spirit he is a member of the Nyack Business Men's Association and the Nyack Country Club. Fond of out-door sports, he was formerly an enthusiastic tennis player, but today confesses to being less keen for such strenuous exercise.

The object of this brief note is to add our congratulations to those of his employees, tendered May 2, upon the occasion of his fiftieth birthday.

BUSINESS CONSOLIDATION.

H. A. Astlett & Co., crude rubber importers and dealers, 117 Pearl street, New York City, have admitted to partnership F. H. Peaty and F. H. Sanford. Mr. Peaty has for many years been prominently identified with rubber interests in New York, and in 1906 with Samuel Kubic formed the Raw Products Co., with which house he was connected until 1913, when he sold his interest on account of poor health. Late in 1914 Mr. Peaty opened an office at 38 Vesey street, New York City, which he discontinued to form his present connection. Mr. Sanford was with the South American house of George A. Alden for 20 years.

H. A. Astlett & Co. took over the business of Shipton Green and have extensive foreign connections. In addition to its large rubber interests, this house is the export agent for the sale of Waltham watches and several other well known and standard American products.

One hundred and fifty cases of rubber which formed part of the cargo of the "Sandefjord" when that ship was seized by a British cruiser and brought into Halifax in November, 1914, were last month condemned for seizure by Justice Drysdale of the admiralty court. The "Sandefjord" was on her way from New York to Copenhagen and was allowed to proceed after this shipment of rubber was removed. Justice Drysdale held that whereas the rubber was shipped by one neutral to another, an enemy designation was intended. He also held that a description of the article as "gum" was deceptive, further justifying the seizure.

RUBBER CLUB 1916 OUTING.

The annual outing of The Rubber Club of America, Inc., will be held July 18, at the Vesper Country Club, near Lowell, Massachusetts, the same place as last year's outing. The committees are making extensive plans for the occasion. Probably the same arrangements will be made for special trains from Boston to the Club grounds and return. Special parties are being made up in Akron, Trenton and New York, and if a sufficient number can be secured from each of these points a special train will be run landing the members directly at the Vesper Country Club on the morning of the outing. The committee having the details in charge is as follows: P. E. Young (chairman), Acushnet Process Co., New Bedford, Massachusetts; Robert L. Rice, Hood Rubber Co., Boston, Massachusetts; F. H. Appleton, Jr., F. H. Appleton & Son, Inc., Boston, Massachusetts.

THE PREPAREDNESS PLAN.

Five hundred and twenty-one men connected with the rubber trade in different parts of the country have been nominated as members of the District Preparedness Committees planned by The Rubber Club of America, Inc., to secure the cooperation of the entire industry in this nation-wide movement for defense. Few of our important industries depend so completely upon imported raw material as does the rubber trade, and therefore this matter of national preparedness is a vital one to all connected with this trade. The plan of the Rubber Club is to so interest the rubber people in each city, town or district that local clubs or committees may be formed for the purpose of exerting a broad influence on public opinion in regard to national defense.

The Rubber Club, at its annual meeting last February, appropriated \$1,000 for the purpose of forming such local bodies, and supplying them with appropriate literature, posters and information. This fund is almost exhausted, and contributions are now being solicited by a circular letter sent, not only to members of the club, but to the trade generally.

RUBBER COMPANY DIVIDENDS.

At a meeting of directors of the Lee Rubber & Tire Corporation held on April 27, a quarterly dividend of 50 cents per share and an extra dividend of 25 cents per share was declared, payable June 1 to stockholders of record May 15.

On May 9 the directors of the Ajax Rubber Co., Inc., declared a dividend of 2½ per cent, payable June 15 to stockholders of record May 31.

The Hood Rubber Co. paid a regular quarterly dividend of 1¼ per cent on the preferred stock on May 1, to stockholders of record on that date.

RUBBER COMPANY SHARE QUOTATIONS

The following market quotations of shares of rubber manufacturing companies on May 25 are furnished by John Burnham & Co., 115 Broadway, New York City, and 45 South La Salle street, Chicago, Illinois:

	Vol.	Asked.
Ajax Rubber Co. (new).....	66½	68
Firestone Tire & Rubber Co., common.....	840	860
Firestone Tire & Rubber Co., preferred.....	111	114
The B. F. Goodrich Co., common.....	73	77
The B. F. Goodrich Co., preferred.....	114½	116
Goodyear Tire & Rubber Co., common.....	392	396
Goodyear Tire & Rubber Co., preferred.....	105	106
Kelly-Springfield Tire Co., common.....	71	73
Kelly-Springfield Tire Co., first preferred.....	95	99
Kelly-Springfield Tire Co., second preferred.....		
Miller Rubber Co., common.....	300	
Miller Rubber Co., preferred.....	115	
Portage Rubber Co., common.....	85	88
Portage Rubber Co., preferred.....	107½	108½
Rubber Goods Manufacturing Co., preferred.....	83	84
Swinehart Tire & Rubber Co., common.....	54	55
United States Rubber Co., preferred.....	108	109

PERSONAL MENTION.

William S. Gordon, general representative of the General Rubber Co., New York City, returned last April from the Far East, and after a short visit to the home office, sailed on the 26th of that month for Manaus, Brazil, where he will relieve D. S. W. Aimers, the general representative there. The latter will leave for England on Mr. Gordon's arrival to join a British regiment and proceed to the front.

William A. Eden, secretary of the Canadian Consolidated Rubber Co., Limited, Montreal, married on April 20 Miss Mabel Spencer Henderson of that city. His friends and office associates presented to him a purse of gold on this occasion. The wedding trip was to southern cities.

R. C. Ritchier has been transferred to the main office of the Westinghouse Electric & Manufacturing Co., Pittsburgh, Pennsylvania. He was formerly in charge of the office of the automobile equipment sales service station of this company at Chicago, Illinois.

Henry G. White, formerly with the Panhard Oil Co., is now representing the Pennsylvania Rubber Co., covering the territory of New Hampshire and Vermont, with headquarters at the Boston, Massachusetts, branch, 735 Boylston street.

Russell Ward Earle, whose retirement from the firm of Earle Brothers, crude rubber dealers, was mentioned in the April issue of THE INDIA RUBBER WORLD, was married May 9, the bride being Evelyn, daughter of Mr. and Mrs. George W. Beavers, of New York City. The marriage ceremony was at the Church of the Heavenly Rest, and the wedding reception at the Ritz-Carlton Hotel, New York City.

Theodore Hofeller, president of Theodore Hofeller & Co., Buffalo, New York, has recently returned from California, where he and Mrs. Hofeller have spent over three months.

Warren MacPherson, proprietor of the Cambridge Rubber Co., Cambridge, Massachusetts, had a curious experience on the Fall River Line boat between Fall River and New York one day last month, having been attacked by a negro who broke into his state-room. Mr. MacPherson was obliged to pass several days at the Stillman Infirmary, Cambridge, nursing cuts and bruises received from the negro's blackjack. It is thought that no very serious results will follow.

Arthur C. Kingston has been appointed general sales manager of the Peerless Rubber Manufacturing Co., New York City. Mr. Kingston was formerly connected with the Revere Rubber Co. for 23 years, the greater portion of that time in the sales department, at Boston, Chicago, and the home office, Chelsea, Massachusetts.

The Barrett Co., New York City, is notifying its customers that owing to the greatly increased cost of drums, charges on 100 to 110 gallon drums have been advanced to \$15 each and on 50 to 55 gallon drums to \$8 each, and calls attention to the necessity that the drums be emptied and returned promptly.

Harrison Bros. & Co., Inc., Philadelphia, Pennsylvania, manufacturers of chemicals, acids and pigments, have removed their New York office to 80 Maiden Lane, to better serve the chemical trade.

In a recent decision upholding the decision of the commissioner of patents refusing registration to the word "Ford" as a trade-mark for rubber tires, the District of Columbia Court of Appeals held that a word which forms a part of a corporate name, even though written or printed in a peculiar and distinctive manner, is unregistrable as a trade-mark.

The Lancaster Tire & Rubber Co., Lancaster, Ohio, is adding additional tire building equipment and will manufacture an impression tread tire as well as its present "Wiregrip" tire.

MR. STEDMAN IN NEW YORK.

ALTHOUGH by birth, training and residence a Boston man, after the first of the present month, Arthur W. Stedman becomes a New Yorker. As manager of the crude rubber department of the Hagemeyer Trading Co., he will be found at 17 Battery place. For a right-hand man he has selected Lewis C. Duffy,

who was with him for 14 years, a part of the time at the Manaus branch. The whole trade know Mr. Stedman, as he has been an active factor in rubber for more than 25 years. At various times he has visited South America and Europe and has thus gained knowledge, friends, and established connections that are of great value. It will be recalled that at the great rubber exhibition in New York Mr. Stedman not only handled the crude rubber from Brazil, for which he was made



A. W. STEDMAN.

an honorary member of the Commercial Association of Manaus, he also took over all the plantation rubber that was sent in by the British Rubber Growers' Association and by many Far Eastern planters. His wise and businesslike handling of this brought him in intimate touch with the most important plantation interests, a connection that he has since kept up.

The Boston business Mr. Stedman has sold to the Rubber Importers' Selling Co., which will continue it at his aforetime offices on Atlantic avenue.

BATAVIA RUBBER CO.

At the annual meeting of the Batavia Rubber Co., Batavia, New York, May 9, the following directors were elected: George W. Hodges, William H. Remick, W. P. Berrien, C. M. Marvin and S. J. Bailey. The directors then elected the following officers: George W. Hodges, chairman of the board; W. P. Berrien, vice-president; C. M. Marvin, treasurer; S. J. Bailey, secretary; William S. Whitman, assistant treasurer.

Plans are under way for the erection of a new office building, the present office space of the Batavia company being needed for factory purposes owing to increased business.

HALIFAX RUBBER CO. TAKES OVER PRENZEL COMPANY.

The Halifax Rubber Co., Halifax, Pennsylvania, has taken over the business of the A. H. Prenzel Rubber Co., of Halifax, with the intention of continuing the manufacture of surgeons' gloves and finger cots carried on by the latter company, and possibly branching out in other lines later on. The personnel of the Halifax Rubber Co. is as follows: John H. Klingman (president Halifax Chair Seat Co., Millersburg, Pennsylvania), president; A. M. Smith (Grain & Coal merchant, Halifax, Pennsylvania, and vice-president Halifax National Bank), vice-president; P. S. Hill (cashier Halifax National Bank), secretary and treasurer; James E. Neitz, manager. A. G. Bashoar, president Alvord Reamer Works, Millersburg, Pennsylvania, and controlling factor in the Millersburg Fifth Wheel Co., is also interested.

NEW INCORPORATIONS.

Federal Rubber Co., The, April 26 (Massachusetts), \$10,000.00. John E. Searle, Francis C. Gray, Branton H. Kellogg—all of 60 State street, Boston, Massachusetts. Principal address, Chicopee Falls, Massachusetts. To manufacture and deal in rubber, gums, rubber substitutes, etc. This company has been incorporated by the Fisk Rubber Co., Chicopee Falls, Massachusetts, to take over the Federal Rubber Manufacturing Co., Cudahy, Wisconsin, which the Fisk company recently acquired.

Acushnet Process Co., Inc., April 27 (New York), \$500. Samuel Wright, Vanderbilt avenue and Forty-fifth street, New York City; Theodore F. Furness, Cunwyd, and E. K. Monnington, Land Title Building, Philadelphia—both in Pennsylvania. A corporation formed to handle New York City business of the Acushnet Process Co., of New Bedford, Massachusetts.

Acme Tire & Rubber Co., Limited, March 3 (Ontario), \$400.00. Joseph Max Bullen, of McMaster, Montgomery, Fleury & Co., 44 King street, West; Francis H. Hurley, 32 Aberdeen avenue; Harold Learoyd Steele, 437 Broadview avenue, and others—all of Toronto, Canada. To manufacture and deal in tires and rubber goods and rubber substitutes of all kinds.

Beaver Mills Co., April 22 (Massachusetts), \$500.00. President, G. Ellsworth Huggins, 299 Broadway; James F. Bacon, George A. Butman, Arthur W. Clapp, F. Chester Everett—all of 77 Franklin street, Boston; Ernest S. McLean, Framingham. To manufacture tire fabrics. Principal address, North Adams, Massachusetts.

Boone Tire and Rubber Co., The, April 17 (Delaware), \$500.00. I. V. Maclean, F. A. Maclean, C. H. Isbell—all of Des Moines, Iowa. Principal address, Des Moines. To manufacture and sell all kinds of automobile tires, etc.

Borderland Tire Manufacturing Co., The, April 6 (New Mexico), \$150,000. J. Thomas Ward, H. M. Mandeville, Gerald H. Totten, Gus Manasse, John L. Burnside, J. C. Miller and F. W. Campbell—all of Las Cruces, New Mexico. Principal address, Las Cruces, New Mexico. To manufacture and deal in automobile tires and tubes, rubber hose and all other kinds and classes of rubber goods, etc.

Brookside Rubber Works, Inc., May 4 (New York), \$25,000. John McLaren, F. B. Knowlton, and E. M. Beyhl—all of 154 Nassau street, New York City. To manufacture rubber goods.

Cut Price Raincoat Co., Inc., May 8 (New York), \$2,000. Charles Henschke and Esther Henschke—both of 214 Rutledge street, and Max Baron, 34 Sumner avenue—all of Brooklyn, New York.

Carolina Tire Co., The, April 18 (South Carolina), \$1,000. J. M. Chapman, president and general manager; D. A. Childs, secretary and treasurer. Principal address, Columbia, South Carolina.

Central Tire Co., The, March 16 (Texas), \$12,000. Grover C. Shaw, Robert S. Yantis, W. S. Magee, and Charles K. Biggs—all of San Antonio, Texas. Principal address, San Antonio, Texas. To deal in automobiles, automobile tires, and accessories.

Delion Tire & Rubber Co., Inc., April 27 (New York), \$50,000. Henry A. Ludeke and Alma Ludeke, 170 Broadway, and Ira A. Worthington, 1791 Broadway—all of New York City.

Dayton Tire Co. of New Jersey, Inc., April 19 (New Jersey), \$10,000. Nathan Schwartz, 468 Washington avenue, Belleville; Frederick D. Ransley, 532 Central avenue, and Irving G. Farmer, Walnut street—both in Newark—all in New Jersey. Principal address, 445 Central avenue, Newark, New Jersey. To manufacture automobile tires and accessories.

Ferry Tire & Rubber Co., April 24 (Delaware), \$50,000. Olive C. Ferry and Mary H. Ferry, Middleberry Center, and Leon H. Klock, Wellsboro—all in Pennsylvania. Principal address, Cap-

ital Trust Co. of Delaware, Dover, Delaware. To manufacture and deal in all kinds of rubber tires and rubber goods.

Globe Tire Service Co., April 21 (Maine), \$10,000. Horace Mitchell (president), H. A. Paul (treasurer), M. G. Mitchell and Benjamin F. Bunker (directors)—all of Kittery, Maine. Principal address, Kittery, Maine. To acquire, repair, sell, and otherwise deal in automobile tires, etc.

Hawkeye Tire Co., July 19 (Iowa), \$500,000. John T. Christie, I. V. McLean, C. B. Hextell, T. H. Dexter, and E. G. Raffensberger. Principal address, Des Moines, Iowa. To manufacture automobile tires, casings and tubes.

Louisville Tire Co., April 4 (Kentucky), \$5,000. Aaron Kern, Ruby B. Kern, A. A. Ericson—all of Louisville, Kentucky. Principal address, Louisville, Kentucky. To deal in automobiles, automobile tires, etc.

Newsom Auto Tire Vulcanizing Co., April 27 (Tennessee), \$75,000. Thornton Newsom, Louis LeRoy, L. R. Forsick, Joseph L. McLean, Jr., and R. P. Cary—all of Memphis. To deal in automobiles, etc.

Oak Rubber Co., The, April 22 (Ohio), \$5,000. John C. Goodman, Paul E. Collette, Lem H. Oberlin, John Shira, and G. W. Auten. Principal address, Akron, Ohio. To manufacture and deal in toy balloons.

Palmer Tire & Rubber Co., May 5 (Delaware), \$500,000. Herbert E. Latter and Norman P. Coffin, Wilmington, Delaware; Clement M. Egner, Elkton, Maryland. Principal address, 394 duPont Building, Wilmington, Delaware. To manufacture and deal in gutta percha and all goods made therefrom.

Pharis-Packard Tire Sales Co., The, April 15 (Ohio), \$10,000. Glen Geddis, Lillian Chope, W. H. Hill, Howard W. White, H. R. Sproul. Principal address, Cleveland, Ohio.

Plantation Rubber Importers, Inc., April 29 (New York), \$50,000. John French, Robert N. Chambers and Henry H. Graff—all of 59 Wall street, New York City.

Quick Tire Service Co., April 3 (Illinois), \$5,000. Kirk S. Miller, Earl F. Miller, Anthon Miller and Thomas H. Edwards. Principal address, 1559 Michigan avenue, Chicago.

R. and O. Tire Co., Inc., April 25 (New York), \$2,000. Charles W. Rehmann and Thomas O'Mara, 240 West Forty-eighth street, and Irene V. Rehmann, 4250 Disney avenue—all of New York City. To manufacture and repair tires, etc.

Richmond Waterproof Products Co., Inc., May 2 (New York), \$25,000. Irving Johnson, Van Duzer street; George T. Simonson, 218 Richmond Turnpike—both of Tomkinsville, New York; and Alfred Falstraalt, 12 Archer Place, Jamaica, Long Island, New York. Principal address, Richmond Co., New York City. To manufacture cement, waterproof products, etc.

Savage Tire Corporation, March 8 (California), \$10,000. J. D. Spreckels (president); Arthur W. Savage (first vice-president); H. L. Titus (second vice-president); Claus Spreckels (secretary), Coronado, California; A. J. Savage (treasurer). Principal address, San Diego, California.

Southwestern Tire Manufacturing Co., March 2 (Oklahoma), \$250,000. W. A. McClelland, J. T. Wheatley, John L. McClelland, Charles W. Gunter and W. F. Westcott. To manufacture and deal in automobile tires, tubes, etc. Address, Colcord Building, Oklahoma City, Oklahoma.

Vargyas Safety Tire Co., The, May 2 (Delaware), \$100,000. Eugene Von Vargyas, Lawrence A. O'Dea, John P. Appelman—all of Washington, D. C. Principal address, Colonial Charter Co., 927 Market street, Wilmington, Delaware. To manufacture automobile tires and accoutrements.

White Tire Co., April 19 (Kentucky), \$10,000. Charles Dobbs, B. H. Plaskett, Emil Von Allen—all of Louisville, Kentucky. Principal address, Louisville, Kentucky. To manufacture and deal in automobile tires, etc.

Young Co., A. M., March 10 (Michigan), \$40,000. Arthur M. Young, Emanuel R. Kuhn and John J. Knight. To deal in the manufacture of metal and rubber specialties. Principal address, Kalamazoo, Michigan.

TRADE NOTES.

Pedro Rafecas is representing Rosenwald & Weil, the well-known manufacturers of raincoats and allied products, Chicago, Illinois, in Central and South America and Porto Rico.

The Dryden Rubber Co., Chicago, Illinois, has added a general line of typewriter accessories to its output.

The Walpole Shoe Supply Co., a subsidiary of the Revere Rubber Co., has been transferred to the new building at 60 High street, Boston, Massachusetts, and now operates as a department, under the name of the Revere Rubber Co. The supply department will continue under the direction of B. F. Chamberlain, formerly manager of the Walpole Shoe Supply Co.

The Ravenna Rubber Co., Ravenna, Ohio, notice of whose incorporation appeared in the April issue of THE INDIA RUBBER WORLD, has purchased a four-story building containing about 45,000 feet of floor space and land covering $3\frac{1}{2}$ acres to allow for future additions. The building is being equipped as a factory for the manufacture of rubber sundries. The company expects to be producing several lines by the middle of the month and to be equipped for full operation before the end of the year.

The Eureka Rubber Manufacturing Co., Inc., rubberizer of textiles for the rubber raincoat manufacturing trade, formerly of 89 Hope street, Brooklyn, New York, has moved to larger and better quarters at Fourth avenue and Eighth street, College Point, New York. Arthur C. Squires, rubber expert, has laid out the plant, to which have been added washers, mills, and a battery of five dry heat vulcanizers. The company will wash and dry crude rubber for the trade; will compound, mill and vulcanize stocks by the vapor, dry heat or open steam processes. Single and double surfaced white sheetings, auto top fabrics and transparent bathing cap fabrics will also be added to the output of the factory.

Richter & Co., Hartford, Connecticut, have obtained control of 4,200 of the 5,000 shares of the Omo Manufacturing Co., maker of dress shields, hospital sheeting and general sanitary goods at Middletown, Connecticut. At the annual meeting of the Omo company was held May 17, at which the following board of directors was elected: W. C. Fisher, Russell Manufacturing Co., Middletown; Edward M. Day, Hartford; James W. DeGraff, selling agent of Omo Manufacturing Co., Plainfield, New Jersey; Ferdinand Richter, Hartford; G. Lloyd Jones, Middletown; Arthur G. Woolley, Hartford; H. M. Burr, Middletown. Later the following officers were elected by the directors: Edward M. Day, president; G. Lloyd Jones, vice-president; H. M. Burr, treasurer; T. H. Barbour, secretary.

The entire business, patents, registered trade-marks and good will of the National Cement & Rubber Co. and the New Process Vulcanizer Co., both of Toledo, Ohio, have been purchased and the entire plants removed to Cincinnati, Ohio, where in future the business will be carried on under the name of the National Rubber Specialties Co., manufacturing a large variety of cements, oils, enamels, vulcanizers, and similar goods for cycle and automobile supplies. The company's address is 4433-49 Chickering avenue, Cincinnati, Ohio.

The Columbus Rubber Co. of Montreal, Limited, is now controlled by the Canadian Consolidated Rubber Co., Limited, Montreal, Canada. A meeting of the directors of both companies held in New York City during Easter week to discuss the terms of sale of stock resulted in the purchase of 2,250 shares of the Columbus Rubber Co.'s stock by the Canadian Consolidated company, thus securing a controlling interest.

SUPERINTENDENT GRANBY RUBBER FACTORY.

CHARLES K. HUTCHINSON, superintendent of the Granby rubber factory of the Canadian Consolidated Rubber Co., Limited, started his business life after graduating from the high school at New Haven, Connecticut, his native city, as an apprentice in a merchant tailoring establishment, but after duly qualifying as a "knight of the needle and shears," he deserted



CHARLES K. HUTCHINSON.

that business in 1892 to become shipper in the L. Candee & Co. factory. Later he became cost clerk, which position he held for ten years, and in September, 1907, he went to Canada to become superintendent of the Granby rubber factory. When that factory was shut down three years later, Mr. Hutchinson was transferred to the head office of the Canadian Consolidated Rubber Co., Limited, at Montreal, as factory cost accountant. In 1915 he was appointed superintendent of labor and efficiency for the company, a position which he filled with thoroughness and ability, and when the Granby factory was again opened, because of the great increase of orders for footwear, partly caused by the demands of the Canadian government for its troops sent to the European war, Mr. Hutchinson was again appointed superintendent, thus returning to the scene of his earlier success. Mr. Hutchinson in his youthful days was an active member and officer in the Connecticut National Guard, later joining the State Naval Militia, and during the Spanish-American war enlisted for active service in the United States Navy. He maintains that his military and naval experience in handling men has greatly helped him in the positions which he has held. He is receiving many expressions of congratulation on his recent transfer to Granby.

THE RUBBER HEEL CLUB OF AMERICA.

At the recent convention of the National Leather and Shoe Finders' Association at Richmond, Virginia, representatives of several rubber companies, which are members of that body were present and formed another association under the name of the Rubber Heel Club of America. The members of this club are: Elastic Tip Co., Boston, Mass.; Essex Rubber Co., Trenton, N. J.; Federal Rubber Co., Milwaukee, Wis.; Foster Rubber Co., Boston, Mass.; O'Sullivan Rubber Co., New York City; Panther Rubber Manufacturing Co., Stoughton, Mass., and Plymouth Rubber Co., Canton Junction, Mass. George A. Stetson, of the Elastic Tip Co., was elected president, secretary and treasurer. The full details of the organization have not yet been perfected, but its objects cover the correction of trade evils and abuses, the education of the general public in the use of rubber heels, and the general improvement of the rubber heel industry. The secretary's address is, Care of Elastic Tip Co., 370 Atlantic avenue, Boston, Massachusetts.

TRADE NOTES.

The U. S. Rubber Reclaiming Co., Inc., New York City, is adding to its factory at Buffalo, New York, a storehouse, 150 x 150 feet, equipped with electric cranes for handling scrap, with a capacity of about 3,000 tons. Ground has also been broken for a new mill at Buffalo, which will be three stories and basement, 150 x 100 feet. The storehouse will be completed within two months, and the mill in the early fall.

We understand that W. M. Mackintosh, inventor of "Galbulose," and who has recently been connected with the Columbus Rubber Co., Montreal, Canada, contemplates starting a factory in the neighborhood of that city for the purpose of treating fabrics with his process, which renders cloth substances so treated waterproof, rot and mildew-proof, and is guaranteed an absolute repellent, and of special value at the present time for treating fabrics for army blankets, tents, ponchos, etc. Mr. Mackintosh is a thorough rubber man. He started with the North British Rubber Co. in 1880 and was with them ten years, after which he was with several Continental and European rubber factories, returning to England and later coming to this country and to Canada.

Joosten & Janssen, rubber brokers, Amsterdam, Holland, have established a branch office at 15 William street, New York City, which will be in charge of Ernest Janssen, one of the partners, and A. F. Baarslag.

The Charles Harley Co., of San Francisco, among the largest operators on the Western coast in scrap rubber and other materials, has opened a New York office in the Woolworth building. H. Greene, well known in waste rubber circles, is the New York representative.

The Berkshire Rubber Co., of Akron, Ohio, has changed its name to the Scioto Rubber Co. and is now located at Columbus, Ohio, at Fifth avenue and the Big Four Railroad. Installation of machinery is completed and the company will manufacture rubber heels, toy balloons, rubber fabric and novelties of all kinds. It is the first rubber factory to locate in Columbus.

The Republic Rubber Co., Youngstown, Ohio, has placed on the market a new black tread tire of remarkable strength and toughness. It is made of their exclusive Prodim Process Rubber or "Prodim." The characteristics of this new triumph in compounding are wonderful tensile strength; practical freedom from cutting or chipping on rough stony roads; remarkable resiliency; smooth wearing; heat resisting quality and light weight.

Rosenwald & Weil, Chicago, Illinois, report having sold 250,000 yards of rubber sheeting and considerably more than 1,000,000 yards of other goods within a year. This concern has recently organized a new department in the plant for calendaring cloths. This is in addition to its regular business of proofing cloth for the trade and the manufacture of a regular line of men's raincoats and similar garments. This firm is rapidly establishing agencies throughout the United States for the products turned out in its establishment.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, has sent to the trade an announcement, effective May 15, of a reduction of prices on its Vacuum Cup and Ebony Tread tires, claiming that although the tendency of the market in many raw materials is, in a general way, distinctly upward, the saving effected, through improvements in its new plant, resulting in a largely increased production, has enabled the company to make this change in prices. Prices on their Paruco Gray and Puregum tubes are unchanged.

A drawback allowance was granted on May 24 on dress shields manufactured by the I. B. Kleintert Rubber Co., New York City, with the use of imported silk piece goods after the same have been dyed for its account by the United Piece Dye Works, Lodi, New Jersey.

FIRESTONE TRUCK TIRES ADAPTED TO RAILWAY TRACKS.

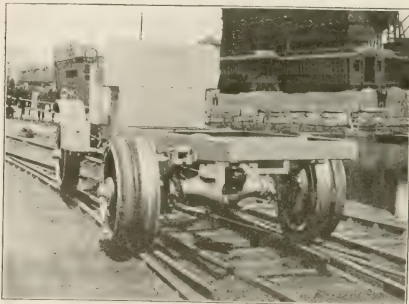
THE adaptation of the automobile to run on standard gage railroad tracks is an accomplished fact. A Riker truck, made by the Locomobile Co. of America recently ran from Columbus, New Mexico, to El Paso, Texas, 93 miles, at an average speed of 18 miles an hour actual running time, carrying 20 soldiers and



MOUNTING SPECIAL TIRE FLANGES.

a machine gun. On its arrival, the steel rims were removed and the truck proceeded on its pneumatic tires to the hotel in El Paso, where Generals Scott and Funston made a careful inspection of the vehicle. General Scott and his engineers pronounced the test to be most satisfactory. The truck left El Paso the same evening for the return trip to Columbus, which was accomplished without incident.

A number of these trucks, equipped with Firestone tires, are to be used by the United States Army in Mexico, below Casas Grandes, where Gen. Pershing controls the railroad. They are equipped with flanged steel rims, fitted over the wheels, which take the rails the same as a locomotive wheel. These rims can be carried on the truck while on regular road service, and when desirable to run the truck over the railway lines, the flanges can be fitted over the tires of the truck wheels, in 15 minutes, and the truck is ready to take the rails under its own power. The



MOTOR TRUCK MOUNTED ON RAILS.

device was invented and developed by A. L. Riker, vice-president and chief engineer of The Locomobile Co. of America. His achievement opens up a new and important field of endeavor for the gas motor truck. Mr. Riker is chairman of the Committee on Internal Combustion Motors of the United States Naval Advisory Board.

TRADE NOTES.

Taylor, Armitage & Co., Inc., well-known dealers in tire fabrics of every description, and selling agents for the American Tire Fabric Co. and the Passaic Cotton Mills, have removed their offices from 346 Broadway to the Equitable Building, 120 Broadway, New York City.

The Newark, New Jersey, branch of the McGraw Tire & Rubber Co., East Palestine, Ohio, is being newly equipped with a 200-ton tire press and other machinery. A full stock of all sizes of McGraw tires will be carried, in both the European and new S. A. E. American types. F. B. Geary, formerly with the Kelly-Springfield Tire Co., has been made manager of this branch, succeeding W. P. Fraley. P. E. Hulick has been advanced to the position of office and service station manager.

The Fisk Rubber Co. of New York has opened offices at 11 Broadway, Bowling Green Building, for the handling of its export trade.

At the first meeting of the directors of the Hartford Rubber Works Co., Hartford, Connecticut, following the annual meeting on April 26, Charles B. Whittlesey was elected president, succeeding E. S. Williams. Mr. Whittlesey became connected with the Hartford company 15 years ago as clerk and has risen through successive stages to his present prominence. The other officers are as follows: Ernest Hopkinson, vice-president, New York City; James P. Krogh, treasurer, Hartford, Connecticut; John D. Carberry, secretary, New York City.

At a meeting of the board of directors of the Motor & Accessory Manufacturers held in New York City May 5, H. E. Raymond and C. E. Whitney resigned as members of the board. W. O. Rutherford, general sales manager of The B. F. Goodrich Co., Akron, Ohio, was elected to fill Mr. Raymond's unexpired term as a board member, as well as an executive committee member. The president also appointed him a member of the finance committee. The election of Mr. Whitney's successor was postponed. Christian firm was made a member of the show and allotment committee.

At a recent meeting of The Motor Tire Reconstruction Co., Norwalk, Connecticut, the following officers and directors were elected: Richard Tjader, retired banker and African explorer, president and director; M. D. Randall, vice-president Mianus Manufacturing Co., Greenwich, Connecticut, vice-president and director; W. E. Goldsborough, consulting engineer, New York City, treasurer and director; R. S. B. Perry, physical director, Montclair, New Jersey, secretary and director; F. C. Goodyear, manager Royal James Inn, Norwalk, assistant secretary and director; Charles D. Burns, Secretary of State of Connecticut, and Joseph J. Ryan, son of Thomas Fortune Ryan, financier, directors.

Joseph Woodwell & Co., Pittsburgh, Pennsylvania, have arranged with the Federal Rubber Manufacturing Co., Cudahy, Wisconsin, to act as distributor of Federal tires in that territory. The Woodwell company will take care of all adjustments, thereby doing away with any possible delay. Harry Webb is manager of the automobile department.

At a recent meeting of the board of directors of the Alliance Rubber Co., Alliance, Ohio, W. H. Christensen, superintendent of the company, was elected to the board to fill the vacancy caused by the death of G. C. Russell, late president. J. C. Shiveley was elected president and treasurer, Milton Bejach, vice-president and general manager, W. H. Christensen, secretary, and John B. Pow, assistant treasurer. The Alliance company's statement to the board and stockholders of April 1 shows a 1500 per cent increase in business over the corresponding period of 1915, the chief lines of manufacture now being

automobile tires and inner tubes, although some mechanical goods are also manufactured.

The Giant Rubber Co., Carlstadt, New Jersey, notice of whose incorporation appeared in last month's issue of THE INDIA RUBBER WORLD, has begun operations in a plant consisting of a two-story building with extension covering an entire block. The factory is being fully equipped for the manufacture of various soft rubber goods, such as gloves, tubing, nipples, bags, etc., and a specialty will be made of the manufacture of inner tubes for automobile tires. For the present, the selling office of the company will be maintained at 217 Mercer street, New York City.

The Perfection Tire & Rubber Co., with factories at Fort Madison, Iowa, and offices in the Marquette Building, Chicago, Illinois, has leased the premises at 1002 Michigan avenue, in the latter city, for the distribution of its product in Chicago and northern Illinois.

The Connecticut Mills Co., Danielson, Connecticut, maker of tire fabrics, has acquired the Nemasket Spinning Mill at Taunton, Massachusetts, which will be promptly equipped for a maximum production of 6,000,000 pounds per annum, which will give that company its own spinning capacity for about one-half of its weaving production at Danielson. The strike at the latter mill, although not entirely overcome, is in process of adjustment.

The new owners of the Beaver Mills, North Adams, Massachusetts, will make a line of tire fabrics which will require much new machinery. Carding and twisting machinery from the Saco-Lowell Shops is being installed and Whittin combers. The mill will be operated in future by leased hydro-electric power from the Connecticut Power Transmission Company. The New York office of the Beaver Mills is at 299 Broadway.

THE MICHELIN AMERICAN PLANT.

A good year's work is shown in the Michelin Tire Co.'s plant at Miltown, New Jersey, ground for which was broken on June 3 of last year, and seven of the buildings being now completed and the eighth probably finished within the present month. The plant, when completed, will have about 8½ acres of floor space and it is claimed to be the largest tire plant in America. The property consists of about 80 acres of ground on which were four large buildings which had been used by the International A. & V. Tire Co. It was decided to use these only for storehouses and offices, and the eight new buildings mentioned have therefore been built for the factory. It is stated that when this manufacturing plant is completed no visits of inspection will be allowed, this being the Michelin inflexible policy and the rule in all of his plants in France, England and Italy. Indeed it is said that at one time the Queen of Italy desired to inspect the processes of manufacture at the Turin factory but permission was refused.

CANNOT REGISTER "NOBBY" IN AUSTRALIA.

The United States Rubber Co. was especially fortunate in its choice of the word "Nobby" as a trade-mark for one brand of its tires, inasmuch as there is a double meaning attached to the word, one meaning aristocratic or elegant and the other really descriptive of the tread, which is covered with knobs. When this company applied for registration of this word as a trade-mark in Australia the examiner objected on the ground that the word was descriptive of the character and quality of the goods, since it was commonly accepted as meaning, having an aristocratic appearance, showy, elegant, fashionable, smart. An appeal was taken to the registrar, but he sustained the decision of his subordinate, basing his opinion on the definition of the word in the Century dictionary.

PERSONAL MENTION.

Lloyd L. Seaman has been made district representative for The Knight Tire & Rubber Co., Canton, Ohio. Mr. Seaman's territory will cover the western and northern parts of New York State, with headquarters at Syracuse.

George W. Larkin, formerly with The B. F. Goodrich Co. at its Milwaukee, Wisconsin, branch, has been placed in charge of the tire department of the Woodward Tire & Repair Co., Detroit, Michigan. The Woodward company acts as distributor of the Miller tire, and although the tire end of the business is the principal feature, a completely equipped accessory stock is also carried by this company.

J. D. Hess, Jr., is now manager of the Cleveland, Ohio, branch of the Firestone Tire & Rubber Co., Akron, Ohio, having been for three years a salesman in the Detroit, Michigan, branch.

E. D. Hensley has been appointed resident manager of the Dayton, Ohio, branch of the United States Tire Co., New York City, having been a traveling salesman for the company since 1913.

George L. Sullivan, formerly associated with a prominent advertising agency in New York City, assumes the office of advertising manager of the Fisk Rubber Co., Chicopee Falls, Massachusetts, on June 1. Mr. Sullivan's experience as advertising man for the Boston Woven Hose & Rubber Co. and later in advertising and in the establishment of agencies with the American Locomotive Co., as supervisor of branches and manager of the Chicago, Illinois, branch of the latter company, renders him peculiarly fitted for his new position. Miss M. G. Webber, who has supervised the Fisk company's advertising in the past and who has been responsible for many of its unique ideas, and George B. Hendricks, who has been in charge of the publicity department, will act as assistants to Mr. Sullivan.

E. T. Battin has been elected a member of the board of directors of the Midcontinent Tire Manufacturing Co., Wichita, Kansas.

A. S. Hetzell, formerly connected with The Knight Tire & Rubber Co., Canton, Ohio, has been appointed sales manager of The Mason Tire & Rubber Co., Kent, Ohio.

J. W. Alexander has been appointed superintendent of the auto tire duck department for the new mill which is being built at Lawrence, Massachusetts, by the Arlington Mills.

MARATHON TIRE COMPANY CHANGES.

H. H. Replogle, formerly manager for The Marathon Tire & Rubber Co., Inc. of New York, at Omaha, Nebraska, has been made manager of sales, with headquarters at the home office of the company at Cuyahoga Falls, Ohio.

G. R. Howell, who has been representing the Marathon company in Iowa, has been promoted to the division managership at Omaha.

C. M. Folger, Southern representative for Marathon tires, has been made division manager at San Francisco.

NEW BALTIMORE BRANCH FOR FIRESTONE.

A thoroughly complete and up-to-date branch has been established by the Firestone Tire & Rubber Co., Akron, Ohio, at Baltimore, Maryland, in the new Walter Scott building on St. Paul street at Mount Royal avenue. This branch is well equipped to care for the demands from the territory it covers, including Maryland, Virginia, parts of West Virginia and half of North Carolina. It occupies 16,000 square feet of space, 4,000 square feet being used for the offices, which are furnished in quartered oak, with quartered oak wainscoting and terraza floor. A garage occupies 3,000 square feet on the first floor. This is to be used for motor trucks and contains a hydraulic press of 200 tons' capacity for solid tires. B. R. Leisure, the manager, came to Baltimore from Salt Lake City, Utah, where he formerly managed the Firestone branch in that city.

RIGHTS OF TIRE DEALERS IN NEW ZEALAND.

A litigation affecting tire importers and exporters and of interest to the tire trade generally was recently decided in New Zealand.

The Dunlop Rubber Co. of Australasia, Limited, has the sole right of manufacturing and selling Dunlop tires in Australasia and New Zealand. Certain concerns, however, imported English-made Dunlop tires into New Zealand without the consent of the Australasian company. The latter, after repeated warnings, brought suit against the importers. The Supreme Court of New Zealand held that the trading rights of the Dunlop Rubber Co. of Australasia, Limited, should be protected and issued a permanent injunction against the defendants, restraining them from selling, offering or advertising for sale any goods under the name "Dunlop" other than those made by the Australasian company. Further, the defendants were ordered to pay the costs of the litigation in addition to a substantial sum for damages.

THE J. & D. TIRE & RUBBER CO.

The directors not named in the incorporation notice of the J. & D. Tire & Rubber Co., Charlotte, North Carolina, appearing in the May issue of THE INDIA RUBBER WORLD, are as follows: H. S. Leyman, Thomas J. Northway, L. A. Folger, J. D. McCullough and E. Thomason. H. O. Smith, president of the company, first entered the rubber business in 1893. He was one of the organizers of the Indianapolis Rubber Co., remaining with that company about 13 years. The Indianapolis company and one other concern were the only manufacturers of the Gormully and Jeffery tires until the G & J patents were sold and the G & J Tire Co. was organized, with Mr. Smith at the head. The other officers of the J. & D. Tire & Rubber Co. are: Thomas J. Northway, vice-president; C. C. Coddington, treasurer, and L. A. Folger, secretary.

The J. & D. company is erecting a new plant consisting of three buildings, all of concrete construction. A one-story vulcanizing room will be located between the two main manufacturing buildings. Electric drive will be employed throughout and automobile tires of the conventional types will be manufactured.

SOME TIRE DON'TS.

The touring season being almost here, The B. F. Goodrich Co., Akron, Ohio, urges motorists to give the proper care to their tires by heeding the following:

- "Don't overload your tires.
- "Don't underinflate.
- "Don't neglect small cuts.
- "Don't run in ruts, car tracks or against curbing.
- "Don't start or stop suddenly or skid around corners.
- "Don't let oil, grease or gasoline remain on your tires. Wash only with pure, cold water and a little soap.
- "Don't keep a spare tire out of use too long. Change over occasionally.
- "Don't let your rims get rusty. Common stove polish will keep them in good condition.
- "Don't let the weight rest on a deflated tire. Jack up the wheel or remove the tire.
- "Don't pinch the inner tube, when applying or removing an outer casing. Pass the hand around inside before re-applying the outer bead. Don't try to force a tire onto the wheel. If it goes unusually hard, look for some trouble."

The Trainer Spinning Co., Trainer, Pennsylvania, is now producing tire fabrics, additional equipment consisting of twistors and looms having been added, and a warehouse built.

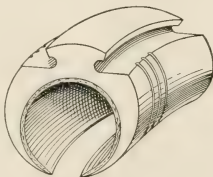
Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Machinery; Rubber Trade Directory.

GOODRICH NEW QUARTERS AT BUFFALO.

The Buffalo, New York, branch of The B. F. Goodrich Co., Akron, Ohio, has been removed from 731 Main street, to 1050 Main street, in the building formerly occupied by the Ford Motor Co. This change of location brings the Goodrich company more nearly in the center of the automobile district and adds materially to the office space, the general arrangement of offices being such that trade can be handled to better advantage. The building is particularly well heated, ventilated and lighted, thus benefiting the comfort and efficiency of the employees, and a 2-ton elevator is a material aid in rendering prompt service. The truck tire department is exceptionally well equipped and the company is able to handle a great many more trucks per day than was possible in the old location.

RUBBER ARMOR FOR AUTOMOBILE TIRES.

An armor or cushion intended to be inserted between the inner tube and the shoe of an automobile tire is shown in the accompanying illustration. It is claimed that this makes the tire puncture proof, non-collapsible, and that it cannot blow out, and the resilience is greater than in tires not thus provided. Besides this, being self-ventilating, the tire is prevented from heating. This device consists of a rubber cushion having a T-shaped head which presses upon the inner surface of the tire; flanks or sides of the armor which prevent the tire from collapsing, and serve as a protection for the tire and tube; and air channels which it is claimed prevent the tube and tire from heating. It is claimed that the T head prevents the tire from flattening and that it will stay at the same radius, making the running and steering of the car easier; that the tire and tube will flatten less from the weight, and that the inner tube need not be pumped up as hard as under the present system without the "Armor." [C. C. Wais, Oakley, Ohio.]



THE LUCK PNEUMATIC TIRE AND RIM.

This is called the botherless tire, because the casing and inner tube are protected against puncture by an extra heavy rubber tread and metal side flanges. The tire itself is built very much

like an ordinary pneumatic tire, with several plies of frictioned fabric, beads of the usual clincher sort and an inner tube. But the actual difference is apparent in the accompanying illustration, and the following explanation:

The sides of the tire are protected by curved flanges, one of which is shown at A, that prevent blow-outs, punctures and side strain. The body of the tire B is made up of five plies of frictioned fabric and the space C provides for the



expansion of the side walls under compression. The inner tube D is very similar to those used in the ordinary casing, but of a special construction adapted to the peculiarities of the casing.

The steel flanges are bolted to the felloe E by eight bolts F that likewise hold the two flanges in place, the heavy, extra thick tread G acting as a protector to the casing, preventing blowouts, rim cuts, blisters and punctures. [Luck Tire Manufacturing Co., Jonesville, Michigan.]

SEIBERLING, STEVENS AND STATE PATENTS VALID.

AN opinion in favor of Frank A. Seiberling, president of the Goodyear Tire & Rubber Co., has been handed down by Judge J. M. Killits late in April, in the suit against the Firestone Tire & Rubber Co., charging infringement of the Seiberling, Stevens and State tire-making machine patents Nos. 725,135, 726,561 and 941,962. The court held the Seiberling-Stevens patents valid and that they were infringed by the Firestone company. The suit was in the United States District Court for the Northern District of Ohio, Eastern Division, at Cleveland, Ohio.

In reviewing the patents, Judge Killits found that their outstanding and unique feature was the provision of methods for taking straight fabric and so stretching and forming it that it would take a cylindrical shape.

Says the judge: None of the alleged anticipations was either intended to produce nor had the capacity to produce one important result which is one of the *desiderata* aimed at both by the patentees of the grants in suit and the defendant, namely, to lay down the fabric so that a structural rearrangement thereof would be brought about to meet most efficiently the changing direction of strain to which a tire is subjected in use, circumferential, transverse, and to some extent at least, torsional.

That these inventions so operate to stretch the fabric circumferentially of the tire and also on the wings of the fabric, as it is being laid down, in the direction of the radius of the circumference, and that these results are highly desirable in an efficient product, no one has very effectively disputed.

In view of the working of plaintiff's Exhibit "32" in the presence of the Court, and of the testimony of Hall that this exhibit was made exactly after the detail of drawings in the Seiberling and Stevens' patent in suit, and of the product of this exhibit in practical use shown in evidence, and further, in view of the state of the art at the time the Seiberling and Stevens' application was made, we feel justified in concluding that their invention was not only the first practical invention to produce mechanically automobile tires having the qualities of service demanded in the use thereof, which qualities were peculiarly the fruit of mechanism effecting the rearrangement of cords to meet the various directions of stress, above alluded to, but that it employed therefor novel and patentable combinations of mechanical elements; that it was decidedly an advance step in the art and so far occupying the field that it anticipated in a large measure both the State and Stevens' inventions.

In fact, we regard the Seiberling and Stevens' mechanism so nearly pioneer invention that the claims of the patent grant therefor should receive liberal interpretation, and we are forced to hold that the three sued upon, Nos. "1," "2" and "14," are valid.

BRITAIN WILL CONTINUE TIRE IMPORTATIONS.

On May 4 a further extension of British embargo lists against importation of various articles was received by the State Department at Washington, to the effect that the British Board of Trade would restrict the importation of many lines of manufactured goods, among them rubber tires and tubes for motor cars and motorcycles. The reason given for this was because of the shortage of tonnage and the necessity of restricting imports to necessities, mainly coal, grain, fuel, timber, munitions, etc. The effect of this decree, which was to go into effect May 12, upon British industry would have been serious for numerous dealers who have existed during the past year or two almost entirely by the sale of American automobiles and tires, and it was stated that if the prohibition was maintained for a year or more, several of the big London agencies would be forced to close down, causing an almost complete stagnation of highly developed British branches maintained by several American tire manufacturers. However, a later despatch states that Walter Runciman, president of the Board of Trade, has announced that motor car tires would not be included in the lists of articles whose importation is prohibited. Arrangements made with manufacturers of rubber goods in the United States led to the decision that the proposal to include tires in the embargo should be abandoned.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

ACCORDING to estimates of the city building department, nearly \$5,000,000 worth of building is under way in Akron, and it is estimated that factory additions alone will total over \$2,500,000 before they are completed. Even at this rate, houses are not being built fast enough to accommodate the hundreds of workers and their families who are pouring into the city every week in response to manufacturers' calls for help.

The rate of tire output at the plant of The B. F. Goodrich Co. is now 17,000 tires daily, last year's record output being 14,000 daily.

An application for a trade-mark consisting of a tire with a black tread with red side walls has been opposed by the Goodrich company, which claims rights to a mark consisting of a black tread, intermediate to circumferential bands of contrasting color or colors, these colors being especially light gray or white. The Goodrich company also claims to have been the first to use red side walls with a black tread, and this contention has been sustained by the Examiner of Interferences.

People in various parts of the United States are familiar with the guide posts which have been erected by the Goodrich company. It is stated that this company has erected nearly 85,000 such guide posts, each individually labeled. Most of these, of course, are in the United States on principal highways, but the northern and southern national boundaries have been passed in some cases in the erection of these valuable guide posts, each of which is also a good advertisement for the company.

W. H. Yule, formerly manager of the New York branch of the Goodrich company, has been made sales manager of the mechanical department at the home office, in which capacity he will be an immediate assistant to W. O. Rutherford, general sales manager, handling the general mechanical specialties of the company in hard rubber, wire and clothing, his work paralleling that of H. C. Miller, who is sales manager of the tire department. Mr. Yule was graduated from Harvard in 1906 and has been directly and indirectly connected with the automobile industry ever since. He is succeeded in New York by H. J. Morehead, who was formerly in charge of the Detroit branch of the Goodrich company.

F. A. Seiberling, president of the Goodyear Tire & Rubber Co., and A. B. Jones, of The B. F. Goodrich Co., were delegates to the National Conservation Congress held in Washington last month.

A new \$30,000 library building recently opened to the students of Akron University was a gift from F. H. Mahon, of The B. F. Goodrich Co. and F. A. Seiberling, of the Goodyear Tire & Rubber Co.

M. A. Flynn, superintendent of The B. F. Goodrich Co., and W. M. Metzler, superintendent of the mechanical goods department of the Goodyear Tire & Rubber Co., represented their respective factories at the State Convention of the Knights of Columbus held in Akron the early part of last month.

The Goodyear Tire & Rubber Co. has dedicated to "The Old Guard," an organization of their old employees who were with the company when P. W. Litchfield, present factory manager, assumed charge 16 years ago, an eight-story tower carrying a huge clock, which will inform all the residents of the city of the time of day. These old employees will hold their annual dinner hereafter in the Old Guard Tower.

The annual relief association picnic of the Goodyear company will be held at Cedar Point on June 24. Eight trains with a

total of 80 coaches will be used to transport the 5,000 employees who will attend the outing.

M. E. Morris, formerly Pacific Coast manager for the Goodyear company, has been made manager of the salesmen's department of the Akron factory.

On June 2 a meeting of the stockholders of the Miller Rubber Co. is to be held to approve the action of the board of directors to increase its present capital stock of \$2,000,000 to such amount as may be determined upon at that meeting. It is understood that if this action is taken, a stock dividend of 66 2/3 per cent will be declared to the common stockholders, provided they will waive their right to subscribe to a proposed new issue of preferred stock to the amount of \$2,500,000, and to consent that the same may be sold by the directors at par, or better. The board of directors has also decided to retire all the present outstanding preferred stock at the price at which it is redeemable, namely, \$120 per share. It is stated that the proposed increase of capital is for the purpose of taking care of rapidly enlarging business, sales for the past six months having increased more than 100 per cent over the same period the previous year.

The American Rubber & Tire Co. is erecting a two-story addition to its plant.

In a spacious laboratory connected with the factory of the Firestone Tire & Rubber Co. and equipped with every modern device to aid in rubber research, H. W. Kugler, head chemist of the company, produces, studies and selects the ingredients and compounds that are used in the manufacture of Firestone tires and tubes. Mr. Kugler's early training especially fits him for this important work. He was born at Barnesville, Ohio, and at an early age went to England. Some years later he entered the Manchester Technical School, remaining there for four years. Immediately thereafter he spent three years as chemist with Dr. Liebman, of Manchester, and in June, 1909, became head of the chemistry and experimental department of the Firestone factory.



H. W. KUGLER.

Charles E. Wood, crude rubber operator, of 24 Stone street, New York City, has opened an Akron office at room 504 Hamilton Building and will be represented there by Walter H. Bass. Mr. Bass, who is a graduate of Princeton College, has been in the employ of Mr. Wood for some time, having been connected with the home office.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

WE do not find people in any branch of the rubber business complaining of lack of trade. Of course, the boot and shoe industry will now have a little lull, for the retail merchants who proposed to take advantage of the extra discount have already sent in their orders, and the jobbers have now a month during which to forward their orders previous to the expiration of the time limit. There seems to be some let-up as regards tennis orders, but all factories are still at work on goods previously ordered, and are rushing them out as fast as possible. In the clothing business trade has been unusually good, and the demand for goods for fall delivery continues to such an extent that some of the manufacturers are practically swamped with orders. Tire manufacturers are busy with more than seasonal demands. In fact, while there are some reports that the higher

price of gasoline has deterred people from buying new automobiles, it is evident that cars already in use are being run and new tires are in demand. In mechanicals, business is quite active in some departments. There is not a seasonable demand for hose, especially of the garden variety, as distributors' stocks are pretty large, last summer being a poor season for retail sales. Drug sundries are more than normally active. Belting is having a boom because of the high cost of leather, and many manufacturing establishments are adopting rubber belting experimentally, which, it is believed, will result in its far wider use, later.

The Boston Woven Hose & Rubber Co. has recently completed two fine examples of factory structures of reinforced concrete. One which will be used for additional manufacturing facilities, has four stories and basement and is 204 feet long by 60 feet wide. It has a floor area of nearly 55,000 square feet. In the center a bay extends the full length of the building in which there is a traveling crane. The other building, which is a storage warehouse for manufactured goods, has also four stories and basement and is 155 x 60 feet, the floor area being nearly 45,000 square feet. These new buildings are connected with other buildings of the factory by tunnels.

The moving picture demonstration of the workings at the Boston Woven Hose company's plant, together with the lecture delivered by Ralph E. Conder, of its advertising department, is giving this company some effective publicity. Mr. Conder has been invited to deliver this lecture before a number of clubs and educational institutions, with the result that the manufacture of rubber goods is being more widely understood and the company gains valuable advertising for the many specialties it manufactures.

The plant and machinery of the Eastern branch of the St. Louis Rubber Cement Co., at West Lynn, Massachusetts, has been purchased by the National Adhesive Co., a Massachusetts concern capitalized for \$15,000, which is to manufacture rubber cements, stains, inks and adhesives for the shoe trade. This company will have branches in Haverhill and Brockton, Massachusetts, and in Auburn, Maine. E. F. Olson is president, E. J. Looke, treasurer, and W. O. Hadley, general manager.

The Monaquot Rubber Works Co., South Braintree, recently gave its employes a voluntary increase in wages, amounting to ten per cent. This is in line with the company's policy of sharing with its organization in the advantage resulting from general business conditions. Plans are under way for the erection, on the company's property, of model homes which will be for the exclusive use of its employes. The allotment which is being thus developed is a very attractive plot of about 12 acres lying across Monaquot Pond from the factory buildings and its situation makes it ideal for the purposes contemplated by the company.

One of the most serious labor disputes in this State this year was the strike of 2,600 employes of the Fisk Rubber Co., at Chicopee Falls, which has been happily settled. The strikers returned to work on May 22, after having been out, or at least a portion of them, since the middle of March. For some time, in spite of negotiations, a deadlock had existed and it was not until about the 20th of May that an agreement could be secured. The settlement of the strike is due in a large measure to the efforts of Frank M. Bump, commissioner of the state board of conciliation and arbitration, who secured some concessions on the part of both the striking employes and the company. The main points demanded by the workmen were an eight-hour day without a diminution of wages, time and a half for over-time, double for Sunday and holiday work, and a recognition of the labor unions. The company has granted all except the last condition. The factory is to

run on eight-hour shifts, two or three shifts, as ability or necessity demands, shift No. 1 working from 7 A. M. to 3 P. M., No. 2 from 3 P. M. to 11 P. M., No. 3 from 11 P. M. to 7 A. M., the shifts to advance their positions every fourth week. As regards recognizing the unions, the company, while not conceding this, agrees to handle questions of dispute through a committee selected from its employes. This is considered fairly satisfactory to the workmen because, all the departments being unionized, this arrangement is tantamount to recognition of the union.

Ira A. Burnham, vice-president of the American Rubber Co., who was quite ill with pneumonia early in the spring, has returned to his office fully recovered. Mr. Burnham is a veteran in the business, having been associated with the Mystic Rubber Co. and the Hall Rubber Co. previous to the establishment of the Stoughton Rubber Co. in 1889, and his business experience in the rubber line dates back nearly 40 years. He was one of the first to discard foot power sewing machines for steam power in factory work and the first to discard the then prevalent solarizing process and introduce vulcanization in dry heaters for proofed fabrics. When the gossamer garment was displaced by the mackintosh the Stoughton Rubber Co. came to the front at once as a



I. A. BURNHAM.

large and profitable manufacturer of raincoat clothing and much of its success from then up to the time of its consolidation with the American Rubber Co. this year is due to Mr. Burnham's knowledge of the business, his executive ability and his enterprise.

The Revere Rubber Co. is now well established at its new office, 60 High street, in this city, where it occupies the second and third floors of what has been named the Revere Building. Here the company has most comfortable and convenient headquarters, both for its office and sales departments and to carry a stock of goods for quick delivery. The windows in the second story, which are of plate glass, have been emblazoned with the trade-marks of the company, one window showing the handsome shield trade-mark which the company uses, depicting Paul Revere on horseback, making his famous ride, the other front windows advertising in colors and gold the "Spring Step" heel, the "Four-Ace" belt and the "Grant Stitched" belt. The rooms are well arranged, there being special private offices for W. D. Rigdon, manager of the New England sales department in the mechanical line, and J. H. Learned, manager of the rubber thread department. Here also are the accounting department, sales rooms and desk rooms for the accommodation of salesmen and customers. Above, on the third floor, are the offices of B. F. Chamberlain, manager of the shoe supply department, and Fred T. Ryder, manager of the sole and heel business of the company. These offices are very convenient for customers, being not far from the shoe center and in the immediate vicinity of the machinery and plumbing supply trades.

At a hearing on May 15 the receivers of the B. & R. Rubber Co., North Brookfield, Massachusetts, were authorized by the court to sell the plant of the company if they deem such a course necessary.

The Revere Rubber Co. will erect a one-story brick building for the manufacture of rubber cement at its factory at Chelsea.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE month of May opened with several of the rubber factories of Rhode Island struggling with labor troubles, some with strikes on their hands and others threatening. Fortunately, however, these were settled in the majority of instances by increasing the wages to meet the demands of the operatives. Few, if any, of the plants have sufficient help to get out the large orders on hand, and to allow any of the operatives to go would be a serious handicap at this time.

The rubber mills throughout the State have had more than a year of unusual and in some cases unprecedented prosperity, and despite the high price that has had to be paid for crude rubber, as well as nearly all of the supplies needed in the industry, it is believed that the profits have kept up with the times, and have been large enough to warrant sharing them with the employees. All of the plants are working full time, or better at present and the heavy demand for goods, especially shoes, that has been noticed for many months past, continues.

The declaration of strikes among the rubber workers was rather unique in labor matters from the fact that they followed the voluntary and unexpected announcements on the part of the concerns of a general increase in wages that affected upwards of 7,500 rubber workers in Woonsocket, Bristol and this city. The first announcement of any increase came from the United States Rubber Co., affecting its mills and subsidiaries, and was quickly followed by other concerns.

On April 27 LeBaron C. Colt, vice-president and general manager of the National India Rubber Co., Bristol, caused notices of the increase to be posted to take effect on May 1. In the notice Mr. Colt said that the company had voluntarily decided to make the advance in wages, but that the exact amount of the increase would not be known until the new schedule had been figured out.

Notices were also posted in the Woonsocket and Millville mills of the Woonsocket Rubber Co. These stated that, as in the past few months, there had been certain increases in day and piece-work prices, commencing May 1 there would be an adjustment and increase of certain other piece-work prices.

As soon as the announcement had been made public of the advance in the Woonsocket and National plants, the Bourn Rubber Co. in this city announced that it would follow the lead of the larger concern and would give an increase to the men, making the same kind of goods that are made in the factories of the United States Co.

The wages of the employees of the Narragansett Rubber Co. at Bristol were also advanced, Terrence McCarthy, the owner and manager, announcing that the new schedule was made to meet the increase in other rubber mills of the State, either on day work or piece-work.

LeBaron C. Colt, vice-president and general manager of the National India Rubber Co., at Bristol, died last week, the result of an automobile accident, on the night of May 18. With Mr. Colt were Albert S. Chesebrough, a yacht designer of international note, and nephew of the famous yacht builder Nathaniel G. Herreshoff, and Col. Luke H. Callan, Superintendent of Highways of the town of Bristol. The machine skidded and plunged down an eight-foot embankment into Narragansett Bay. Mr. Chesebrough was instantly killed. Col. Callan escaped severe injury, and rescued Mr. Colt who had been pinned beneath the machine. It was believed that while Mr. Colt's injuries were severe he would certainly recover, but pneumonia set in and he succumbed one week after the accident.

The Manhasset Manufacturing Co., Putnam, Connecticut, of which Roland H. Ballou of Woonsocket is treasurer, is soon to

open the addition to its plant which has been under construction for two months, and which will nearly double the output of the plant. The company makes automobile tire duck and is running night and day, and according to Superintendent A. D. Lown, will continue for some time to do so.

The company intends starting work soon on six new dwelling houses for operatives. These will hold three families each and will probably be located on land just south of the recent addition.

The Tire Shop, Romeo A. Bonin, proprietor, has removed from 127 Court street to its new and larger quarters at 143 Court street, Woonsocket, where a tire repairing shop fitted up with the most modern appurtenances has been installed.

The Narragansett Rubber Co. at Bristol is having a new elevator for handling freight set up in the mill. Several of the departments in the plant are being operated nights.

Rapid progress is being made in the erection of additions to the north part of the mill of the National India Rubber Co. at Bristol.

Dr. Edward B. Knight, secretary of the New England Butt Co., Providence, died at his home, 366 Broadway, that city on May 8, of heart trouble. He had been in ill health for several years and about three weeks previous to his death his condition became very grave. He retired from medical work about 14 years ago, but prior to that time he had established an extensive practice. He graduated from Harvard Medical School in 1867. He had been secretary of the New England Butt Co. for several years and his son, Russell W. Knight, is treasurer of that concern.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

THE John E. Thropp's Sons Co. is steadily increasing its rubber machinery export business. A tire making machine was recently shipped to the Paris Rubber Co., Paris, France. Another shipment of molding and wrapping machines was sent to a concern in Lyons, France. A plant in Argentine Republic for the manufacture of tires was recently completely equipped by this company. Among orders in the Thropp shop now in process of completion is one for the new tire making plant of the Brunswick-Balke-Collender Co. They are also completing the equipment for the new Zee Zee Rubber Co.'s plant in Yardville, New Jersey.

Fire which started in the drying room did \$20,000 worth of damage to the plant of the Delton Tire and Rubber Co. A watchman who discovered the blaze made ineffectual efforts to extinguish it. A nearby volunteer fire company responded but the blaze gained rapid headway and it was necessary to call on the Trenton department for aid. The factory is in Hamilton Township, just outside of Trenton. When the engines arrived from that city the building had been practically gutted. The work of reconstruction was at once taken up and the plant, equipped with new machinery, will be in operation shortly.

The rubber sundries plant of Gropp & Gedney was damaged to the extent of \$1,000 by a fire of unknown origin. Most of the damage sustained was to equipment and supplies.

Plans are under way for a great industrial show in the Trenton armory in October. A big rubber show will be part of the affair if the plans are carried out. Among those on the general committee to arrange for the show are J. Cornell Murray, of the

Empire Rubber & Tire Co., and Alfred Whitehead, of the Whitehead Brothers Rubber Co.

WESTERN NOTES.

THE Macandarbua Elastic Tire Filler Co., Inc., a \$25,000 corporation manufacturing a patent tire filling composition, is building a factory at Oakland, California, 40 x 111 feet in dimensions. With the present equipment tires can be filled for 20 cars per day. This company has its main factory at 1722 Fairmount avenue, Philadelphia, Pennsylvania, is now operating in the Central Western States, Illinois and Indiana, and intends entering Oregon and Washington also. J. H. Copeland is the inventor and patentee of this tire filler, which is claimed to be a panacea for tire evils such as punctures, blow-outs and rim cuts.

The Peters-Tucker-Hay Rubber Co., Denver, Colorado, whose incorporation was noted in the May issue of THE INDIA RUBBER WORLD, has the exclusive agency for the Knight and Blackstone tires manufactured by the Knight Tire & Rubber Co., Canton, Ohio. H. G. Peters, president, was formerly treasurer of the Boss Rubber Co., Mr. Hay and Mr. Tucker also being connected with that company.

The St. Louis Rubber Manufacturing Co., St. Louis, Missouri, has changed its name and location and will hereafter be known as the Bunker Hill Rubber Works, Bunker Hill, Illinois.

The Portage Rubber Co., Barberton, Ohio, has established a new branch on the Sheridan Road, corner of Broadway, Chicago, Illinois, a point passed by practically every automobile going out of Chicago to the north, and therefore a convenient location for many users of its tires.

The B. F. Goodrich Co., Akron, Ohio, has established a wholesale stock depot at 406 Myrtle avenue, El Paso, Texas, which will be a dealers' service station, designed to facilitate delivery of supplies and to work for the dealers' interests. C. K. Chapin will be in charge.

The United States Rubber Co. of California, Los Angeles, has recently moved into a new building at 923 South Los Angeles street, which allows space for carrying and handling a much larger stock than in the old location. The new building is three stories high, with 90 feet frontage and 175 feet depth. In addition, the company has a separate building, approximately 40 x 75 feet, devoted exclusively to solid tires.

Richard Leigh, a well-known Eastern rubber man and tire expert, has been made general manager of the Dry Climate Tire Manufacturing Co., Denver, Colorado.

SAVAGE TIRE CO. EXPANSION.

The Savage Tire Co., San Diego, California, has been growing very rapidly during the last year, and is now manufacturing about 250 tires per day, as compared with 75 a year ago. The capitalization has recently been increased to \$5,000,000, and it is predicted that within a short time the output will be 700 to 1,000 tires daily.

The Savage company is also planning for distribution of its tires all over the United States. Branch stores have been opened in Chicago and New York, the former branch controlling the middle West, distributors having already been appointed at Kansas City and St. Paul, while the New York branch will look after the distribution in the Western and New England states. A number of additional distribution points will also be arranged for through the South.

AN INTERESTING EXHIBIT OF BRAZILIAN PRODUCTS.

DR. EUGENIO DAHNE is a man of action. He generally accomplishes what he plans to do or knows the reason why. His remarkable work in exploiting Brazil and its products at world's fairs and rubber exhibitions is well known to our readers, as is also the exhibit he has arranged at the Panama-California Exposition at San Diego. Mention was made in our April issue of the departure of Dr. Dahne for Brazil to secure more exhibits, and the prediction made that he will come back with much rubber, coffee and a great variety of interesting Brazilian products.

It must not be inferred, however, that the Brazilian exhibit at San Diego is not already a well-arranged and important



PART OF THE BRAZILIAN EXHIBIT AT SAN DIEGO EXPOSITION.

one. Some pictures of the exhibit, as arranged at the opening, were shown by us in September, 1915, and certainly these gave a good idea of its size, scope and seeming completeness. Dr. Dahne, however, was not satisfied, and plans even more comprehensive exhibits. The picture on this page gives an excellent idea of the products of Northern Brazil, exhibiting rubber, forestry and game. The approach to this department is through a long aisle, on one side of which are shown the products of Central and on the other those of Southern Brazil. The main attraction of this department is a representation of a rubber gatherer's house. This is decked with trophies of the hunt, skins, clubs, bows and arrows, while behind and above is a large map of the Republic of Brazil and the columns are festooned with national flags of the Republic. At the other end, but not showing up well enough to reproduce in this picture, is a representation of a South American jungle with growing plants brought from the tropics, this natural verdure being backed by a huge painting of a Brazilian forest. Here also is a rubber gatherer's hut, with the usual tools and implements used in the gathering and smoking of rubber. There are specimens of every kind of rubber produced in the country, cases of rubber seed, and small rubber trees growing in pots, and the walls are covered with large photographs illustrating the various steps from gathering the latex to shipping the crude rubber.

It will thus be seen that this department and the exhibition of some five tons of different varieties of rubber which are arranged at the approach to this special department well represent the rubber industry of Brazil, and that if Dr. Dahne brings with him on his return still further additions, it would seem as though this exhibit would be the most complete of any ever shown of Brazilian rubber.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

IMPORTED RUBBER TIRES.

IN the April issue of THE INDIA RUBBER WORLD it is stated that the British duty on rubber tires is 33½ per cent ad valorem; it should be noted, however, that although this duty was proposed it was subsequently abandoned. There is a general feeling among manufacturers and among workmen engaged in tire making works that a heavy import duty should be levied or even total prohibition ordered. No tires, of course, are coming from enemy countries, and the only imports which really count are those from the United States. Business is still being done in well-known French makes and this introduces complications, which those who are clamoring for legislation on the matter do not perhaps sufficiently take into account. It is not unnatural that the very great increase in the business done with America should be somewhat resented by home manufacturers who, owing to being engaged at present on special government work, are handicapped in competing with those American firms who are continually extending their activities in Great Britain. From the tone of the most recent parliamentary Board of Trade reply to a query on the subject, I think it is not at all improbable that the present American imports will be affected in the near future, not by the imposition of a heavy duty, but by an extension of the restricted imports order, to include motor and cycle tires. It must not be overlooked, however, by those advocates for protection, who are now so prominent in numerous branches of trade, that not all the imported tires are used for pleasure motoring, and that it might prove to our disadvantage at the present time, with the increasing labor shortage and other trials, to have to depend practically entirely on the home output.

THE PROOFING BRANCH.

Beyond the work on existing government contracts there is no great activity in the trade, home trade being decidedly slow, as is also new foreign business. Large government orders for certain goods which have been on the tapis for some time, have not yet matured, owing, it is said, to differences of opinion as to the quality and price which, in the case of straightforward manufacturers, always synchronize. A discussion as to what constitutes a weatherproof or a waterproof, which has been going on in some trade papers, is not without importance, and although I am not aware of any legal decision on the point, I may say that it is the opinion of leading men in the rubber trade, that a waterproof garment means one proofed with rubber, while a showerproof or weatherproof indicates cloth which has been chemically treated so as to repel rain, but has no impermeable layer of rubber. If the term "mackintosh" was universally used for a rubberized garment—to use an Americanism not favored in this country—it would simplify matters; but outside of one large firm, there is no very general disposition among manufacturers to limit themselves to this term. It is contended that "weatherproof" applies to both rubbered and non-rubbered goods, while showerproof does not, but in the present unsettled state of definition, purchasers had better ask for rubber or non-rubber goods and see that they get what they want.

THE GARMENT WORKERS' STRIKE.

The strike of members of the United Garment Workers Society still continues at the works of the Premier Waterproof and Rubber Co., Limited, Manchester, the firm having declined to offer more than 10 per cent advance in wages. The advance of 40 per cent and more demanded has been conceded by other local manufacturers. Advances, it may be said, have been pretty continuous at various works since the war began, a good deal depending on the exact class of work, and thus it happened

in more than one case that when the secretary of the Workers' Society put his demand before a firm, it was discovered that the firm was already paying practically the whole advance requested and was naturally disinclined to quarrel over the trifle that remained to be either granted or refused. The strike at the particular works mentioned has, it should be stated, by no means paralyzed the business, because only the makers-up, and not the proofers, are affected; and, further, there has been no strike among the hands employed on government work, as these come under the supervision of the Ministry of Munitions, which has the emergency power of proceeding severely against absentees from work. Other branches of the work's business also continue in full swing. This increase in garment workers' wages must fall eventually upon the purchasers of waterproofs, though the question of a rise in price is complicated, because the present agitation is confined to the Lancashire district, and does not include the Scottish and London districts.

DISABLED SOLDIERS EMPLOYED.

H. L. Rothband, of J. Mandelberg & Co., Limited, has been prominent in a scheme for finding regular employment for disabled soldiers, several of whom are now employed in these works. Although the firm, of course, is well known as rubber proofers, it has always done a large business in rain and showerproof goods. One of the latest developments at the works is the dyeing and rainproofing of worsted dress serges by the "Silco" process whereby the goods, it is claimed, will not shrink, cockle nor spot.

AMERICAN RUBBER BOOTS PREFERRED.

Officers who have experienced the discomforts of waterlogged trenches during the past winter, speak highly of the rubber thigh boots known as "Bullseye" made by the Hood Rubber Co. These are retailed to them at 35 shillings a pair. They have very thick soles, and are rather clumsy, but they are said not to slip and for this reason are preferred to others of British make of more presentable appearance but having thinner soles.

RECLAIMED RUBBER.

An article on "Regenerated Rubbers," which appeared recently in the "Gummi Zeitung," is especially interesting at the moment, as evidence that a country considered preëminent in chemical knowledge has not yet learned the way to treat waste rubber to the best advantage. Her source of supply from Great Britain and America having been cut off, she has had to fall back upon Continental products, made in either Germany or Austria, and perhaps the Scandinavian countries. Analyses and comparative prices of various Continental regenerated rubbers, or reclaims as we call them in England, are given by the author to show how far away the price is from indicating actual value. The writer goes on to say that it is amply evident that the market is sorely in need of adjustment. He has little to say in favor of Continental makes of reclaimed rubber. It is a well-known fact that in pre-war times considerable quantities were imported into Germany from Great Britain and America. It was thought that the loss of this business would be severely felt, but both countries have found that it has been quite made up by new home business. This transference of trade from foreign to home account is a considerable help to the reclaimer, through the saving of freights and credits. It seems hardly possible that the article was written by a practical man, otherwise the products of this country would have been bracketed with those of the United States, as our manufacturers here can and do produce reclaimed rubbers in no way inferior to the best

American makes, this statement being borne out by the fact that the production here for many years past has been advancing by leaps and bounds, exports prior to August, 1914, going to all countries having rubber works. Great Britain, of course, is indebted to the United States reclaimers for having been shown how to produce reclaims at a competitive price and quality, and also to United States manufacturers for showing how it can be used in quantities. Now the pupils claim to be equal to their teachers and the trade here looks forward to the future with confidence, as, however low the price of their rubber may be, the cost of waste must be in proportion, and so enable the reclaimer to put his products on the market at corresponding prices.

TRADE MEMORANDA.

Since the death of Mr. Openshaw, the proprietor of the Holt Town Rubber Co., Limited, Holt Town, Ancoats, Manchester, manufacturer of reclaimed rubber and rubber substitutes, this works has passed into the hands of Laughton & Son, who carry on a similar business near Manchester.

The Alpertown Rubber Works at Wembley, near London, which has now been closed down, was a reorganization of that ill-fated rubber boom concern, the Crude Rubber Washing Co., Limited. On the failure of the original enterprise, whose factory was in London, the Alpertown concern started to manufacture tires and other mechanical rubber goods, with the above-mentioned result.

Thomas Lilley, whose death was recently announced, was a partner in a large wholesale boot and shoe business in London, but became prominently connected with the rubber trade some years ago as chairman of directors of the Premier Waterproof and Rubber Co., Limited, of Manchester, when the works were taken over from a former private company.

The annual meeting of the Society of Chemical Industry is to be held in Edinburgh, where a new section was formed last year. I may mention that the local secretary of the section is B. D. Porritt, chief chemist of the North British Rubber Co., and as he will be responsible for the organization of the proceedings, it is probable that members who are ignorant of the rubber manufacture may have an opportunity of seeing something which will interest them.

Sir F. H. Smith, Baronet, chairman of Charles Macintosh & Co., Limited, has been appointed on the Board of Trade Committee appointed to consider the position of the British textile industry after the war. This is owing to the fact that he is now and has been for many years actively associated with the staple Lancashire industry.

Among the most recent enemy firms to be wound up is the New York-Hamburg India Rubber Co., Limited, presumably because the Hamburg element predominates over the New York.

Lindsay and Williams, Limited, at whose works an explosion of naphtha was mentioned a few months back, are now moving their business to larger premises at Bennett street, Ardwick, Manchester.

OTHER BRITISH NOTES.

THE conclusion of Justice Peterson in the Chancery Division, Manchester, in the action of Cohen and another v. Fidler & Co., in which both parties claimed the use of the word "Regent" as a trade-mark for waterproof clothing, was to the effect that the plaintiffs had established a reputation for their goods under that name prior to the time when the defendants commenced to use the word, and that its use by the defendants was calculated to mislead. He therefore granted injunctions and dismissed the defendants' motion, with costs.

THE NEXT LONDON RUBBER EXHIBITION.

The announcement has been made that the Fifth International Rubber and Allied Industries Exhibition and the Second International Cotton, Fibres and other Tropical Products Exhibition

will be held in London in May or June, 1919, under the same direction as the previous exhibitions, A. Staines Manders, organizing manager and Miss D. Fulton, organizing secretary.

DR. WILLIS NOW IN ENGLAND.

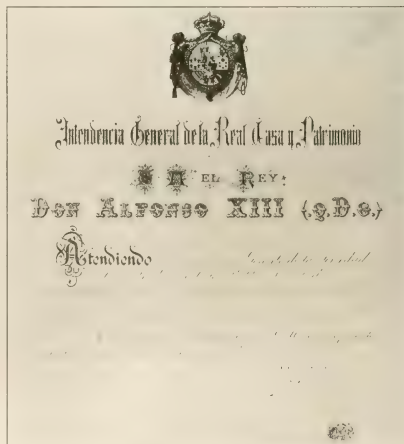
Dr. J. C. Willis, having resigned the directorship of the Botanical Gardens at Rio Janeiro, has returned to England, and is now living at Beechcroft, Clarendon Road, Cambridge, where he is devoting his time to botanical work. It will be remembered that Dr. Willis when in the Far East was director of the Royal Botanical Gardens at Peradeniya and editor of the "Tropical Agriculturist," published at Colombo. Dr. Willis writes that he does not expect ever again to have much to do with rubber, though he will always be interested in the progress of the rubber planting industry.

CHANGE STYLE OF FIRM NAME.

The firm of Ritter & Hankin, 27 Mincing Lane, London, E.C., England, have sent out notices to the trade that they have decided to alter the name of the firm to Geo. Hankin & Co., the change to date from the first of May. There is no alteration in the general conduct or constitution of the firm, which will be continued as heretofore.

A ROYAL DOCUMENT.

The North British Rubber Co., Limited, Castle Mills, Edinburgh, Scotland, has been made by special appointment supplier of pneumatic and other tires and general rubber goods to His Majesty, King Alphonso XIII of Spain. A reproduction in



miniature of the diploma or certificate of appointment is shown upon this page and will be examined with some interest and curiosity. We understand that this company has equipped a royal automobile with clincher tires.

SEIZED RUBBER CONDEMNED.

The British Prize Court has condemned both the ship "Suldanha Da Gama" and her cargo of rubber, which was seized just off the south-east corner of Iceland and taken to Kirkwall, March 6. The testimony was that this ship sailed from Para on February 6 and all the documents and papers, bills of lading, invoices, etc., were for New York. No tidings were received from her

prior to the seizure, off the coast of Iceland, as absolute contraband. The captain, who was the owner of the ship, explained his being in that location by claiming that his ship needed repairs which could be done cheaper in Norway than in New York. Afterwards he claimed that the price of rubber in New York had fallen, and therefore he decided to take the cargo to Norway in hopes of better returns. The president, in giving judgment, said there was no question that the real destination of the cargo was Germany, and that the ship was carrying contraband, and also was sailing under false colors, and therefore both ship and cargo were condemned as a lawful prize.

On May 23, the Prize Court condemned 1,400 parcels of rubber which were taken from the first-class mails on the Dutch steamer "Gelria," while she was on her way from South America to Holland. It was claimed that these parcels were destined for Germany. This is one of the instances where mails from neutral countries and on neutral vessels have been examined and seized by the British, a practice which is the subject of a note of protest sent to London by the United States Government last month. The British Attorney-General, in presenting this case, pointed out the fact that such seizures had laid the government open to criticism by neutrals on the ground that it was a violation of the Hague Convention, but he declared that it should be realized by neutral governments that there had been in this case an attempt, on a very large scale, to use the shelter of the Hague Convention to smuggle contraband goods into Germany.

The decision of the Court was that the parcels in question had been dishonestly sent by post as though they were postal correspondence, and that under the Hague Convention it was expressly laid down that postal correspondence should not cover and include parcels.

THE RUBBER TRADE IN GERMANY.

By Our Regular Correspondent.

THE situation here has not improved since I last communicated with you and, generally speaking, it cannot be said that either trade or industrial conditions are brilliant. Concerns that have government orders are fairly busy but those who have not this good luck find time for meditation. The domestic trade in rubber and rubber substitute articles is very slack as is also the trade we have been doing with adjacent neutral countries. The building trade is practically dead and shipping, limited to the Baltic since the outbreak of the war, is becoming more and more restricted.

The economic relations between Germany, the Balkans and the Near East which have been widely discussed in commercial and industrial circles here, are not measuring up to expectations. In spite of our enemies' blockade we have been able to continue to do business with all parts of the neutral world, but of late this trade has become so restricted that it hardly is worth mention. Our fiscal year comes to an end March 31, and this date is always preceded and followed by a slack period in business activities. This year, however, this state of trade industry cannot be attributed in any wise to the inventory period but to conditions created by the war.

RUBBER TRADE WITH THE ORIENT.

Prior to the war we did a good business in rubber goods with the Balkan States, Turkey and Persia. After the government placed an embargo on rubber exports the demands of these markets continued to be supplied to some extent from stocks of goods manufactured before the outbreak of the war and with substitute qualities. Of course this business was small, but it was very welcome under the circumstances, in spite of the difficulties of exchange that always mark Oriental trading. This small business is now practically dead, notwithstanding the opening up of direct communications which was accomplished last year.

RUBBER INDUSTRY.

Our rubber industry is in no better condition than other branches of trade or production. Manufacturers who are making tires and other supplies for the army and navy are fairly busy, but not working under as high pressure as they were last year. Crude rubber grows scarcer and more expensive, and is now available for use only on government contracts. By mixing what crude rubber we can obtain, with synthetic rubber and rubber substitute our mills are managing to meet the demands of the military administrations. Goods for private use containing crude rubber are distributed only by special permit which is allowed only in exceptional cases.

For compounding ingredients we are not so badly off, but prices are exceedingly high. Solvents are plentiful and their prices continue to be regulated by the Government.

LEATHER SUBSTITUTES.

Many of our rubber manufacturers are finding a profitable occupation in the manufacturing of leather substitutes. Leather has become so scarce, and its price so high, that it cannot be used extensively for other than military purposes. Further its use is restricted by government decrees. The state of affairs has created a considerable demand for substitutes made from various compounds which our rubber industry has created.

MECHANICAL GOODS.

Outside of the demands of the military, and of the industries working under government contracts, little or nothing is being done in mechanical rubber goods, if these, as now manufactured, can still be called rubber goods.

The shortage of necessities of life, especially grain, has led to further restriction of the brewing industry, which was one of the best customers of our manufacturers of mechanical rubber goods. We are importing important quantities of beer from adjacent neutral countries, especially from Denmark, but have sold but little mechanical rubber goods to these neutral countries. The fact is that it is better so, for the qualities we are now producing would surely hurt the good name of German rubber goods.

The "Gummi Zeitung" in a recent issue published two clever cartoons reproduced from an English paper. One represents John Bull joyfully welcoming a ship loaded almost to its topmasts with American automobile tires. The companion picture depicts his gloom as he shows his empty pockets, while the ship is sailing homeward to the United States, stacked high with British gold. Commenting on this, our leading trade publication



says that we are better off than the British, in spite of our lack of raw materials. We are manufacturing our own tires, and doing what the cartoon advises, keeping our gold at home.

Rubber Planting Notes.

RUBBER PLANTATION COMPANIES' REPORTS.

RUBBER plantation companies' reports recently published, show that successful results are general. A notable feature is the reduction in all-in costs. Among other instances of excellent financial results are the following: The Sungei Way (Selangor) Rubber Co., Limited, 52½ per cent dividend; the Udalage Tea & Rubber Co., Limited, 35 per cent; the Peacock and Nilambe Tea & Rubber Co., Limited, 12 per cent; Pandula Valley (Ceylon) Tea Co., Limited, 35 per cent; Pantiya Tea & Rubber Co., Limited, 30 per cent; Hingurugama Tea & Rubber Estates, Limited, 24 per cent; Kepong (Malay) Rubber Estates, Limited, 75 per cent. The Anglo Malay Rubber Co., Limited, is raising its dividend from 32 to 60 per cent for the year, the Cheronese Estates Co., Limited, from 15 per cent to 20 per cent, and the Mahawale Rubber & Tea Co., Limited, from 27½ to 60 per cent. The Seafeld Rubber Co., Limited, paid a final dividend of 65 per cent, compared with 45 per cent for 1914. The Pataling Rubber Estates, Limited, report 225 per cent dividend for 1915 against 175 for 1914 and the Selangor Rubber Estates, Limited, have declared a 165½ per cent dividend.

Generally speaking, shareholders in rubber plantation companies have good reason to be satisfied with the present results, and the prospects for the future are certainly promising.

ACETIC ACID VERSUS OTHER RUBBER COAGULENTS.

Kelway Bamber, chemist, Ceylon Department of Agriculture, has recently visited Java, Sumatra, and the Federated Malay States. In the course of an interview granted to our contemporary, the "Ceylon Observer," he said that he was pleased with the growth of trees on rubber plantations in the Malay States. He was, however, of the opinion that thinning out was not done early enough, especially in the case of the older trees. Where thinning out had reduced the number to 80 or 90 trees per acre, at a reasonably early stage, he noticed that the yield had improved. He was much interested in the vulcanizing experiments being carried out by Mr. Eaton at the Experimental Station at Kuala Lumpur, and considered as especially valuable those relating to the time of vulcanization. The cost of acetic acid has risen enormously, both in Java and in the Federated Malay States, with the result that other coagulents are being recommended. He believed estate superintendents should be warned against using various coagulents, as many of them have been shown to considerably affect the time of vulcanization. In Mr. Bamber's opinion the fact that rubber manufacturers were accustomed to rubber coagulated with acetic acid made it a mistake for plantations to ship rubber, even of a better appearance, which might upset compounds and possibly cause the spoiling of manufactured goods, in which case there would result a feeling of distrust among the manufacturers which might influence prices of all plantation rubber.

RUBBER PLANTATIONS IN FRENCH COCHIN CHINA.

The following table showing the extent of rubber plantations in French Cochin China, has been compiled from data recently published in the "Annales des Planteurs de Caoutchouc de l'Indo-Chine," the official quarterly bulletin of the Rubber Planters' Association of Indo-China:

Province	Area in hectares	Number of Trees Planted
Graciosa	1,157,656	78,300
Banlieue	13,400	1,447,200
Banlieue	362,075	4,000
Banlieue	618	1,200
Yamouh	5,944	43,000
Thien-tien	10,451	1,242,986
Total	3,8013	4,747,922

A NEW BULLETIN ON RUBBER TAPPING.

The Federated Malay States Department of Agriculture has published a bulletin on "The Tapping of the Para Rubber Tree," by E. Bateson, which contains much of interest to those who study the technical problems connected with rubber tapping.

The investigations covered in this publication are divided into six main sections, dealing with the effect of tapping on the starch reserves, lateral transport of food in bark, tapping systems, theory of tapping and, finally, a section on "some practical considerations as regards the effect of tapping on the starch reserves." The conclusion reached by Mr. Bateson is that "if any depletion of the starch reserves is caused by tapping, it is small in amount and temporary in duration." He rejects Fitting's suggestion that an examination of the starch reserves would be a useful method of determining when trees are ready to be retapped after the whole of the original bark has been removed, believing that "such examinations are unnecessary and that the thickness of the renewed bark forms a perfectly safe criterion."

Regarding the effects of leaf change upon starch reserves, Mr. Bateson considers the facts elicited by his research somewhat too meager, on account of the small number of trees examined, to enable precise conclusions to be drawn on the points of theoretical interest. He believes, however, that in the Federated Malay States the effects of wintering are spread over such a long period that they merely form part of the general problem of devising a method of tapping, which, over a period of years, will not be so exhaustive to the tree as to check its full and natural development.

In his tapping experiments Mr. Bateson describes only three methods; the single-quarter system with two cuts on one quarter, the adjacent quarter system with one cut on each of two quarters; and the opposite quarter system with one cut on each of two quarters. He found that the bark of trees tapped by the adjacent quarter system contained more starch than the bark of the trees tapped differently, and that the thickness of renewing bark was greater. As to rubber yield, the single quarter system was 16 per cent better and the adjacent quarter system 31 per cent better than the opposite quarter system, while the adjacent quarter system yielded 13 per cent more than the single-quarter system of tapping.

Mr. Bateson is of the opinion that if trees growing in a soil of average fertility are allowed sufficient space, four years will be found quite adequate for bark renewal.

AREA UNDER RUBBER IN COORG, BRITISH INDIA.

According to the official "Report on the Administration of Coorg, 1914-1915," the total area under rubber in that province of British India is 3,367 acres.

TIRES IN SOUTH AFRICA.

It is reported that the Dunlop Rubber Co. (South Africa), Limited, has received a repeat order from the South African Union Government for 350 pairs of motorcycle tire casings, for use with the machine-gun section for further operations in German East Africa.

Number of Trees in Bearing in—					
1915	1916	1917	1918	1919	1920
430,300	430,300	430,300	430,300	430,300	430,300
1,117,300	1,117,300	1,117,300	1,117,300	1,117,300	1,117,300
21,000	21,000	21,000	21,000	21,000	21,000
5,500	5,500	5,500	5,500	5,500	5,500
60,000	60,000	60,000	60,000	60,000	60,000
208,995	208,995	208,995	208,995	208,995	208,995
1,887,165	1,887,165	1,887,165	1,887,165	1,887,165	1,887,165
2,870,524	2,870,524	2,870,524	2,870,524	2,870,524	2,870,524
3,579,003	3,579,003	3,579,003	3,579,003	3,579,003	3,579,003
4,644,536	4,644,536	4,644,536	4,644,536	4,644,536	4,644,536

THE WIDE PLANTING OF RUBBER.

THE Department of Agriculture of the Federated Malay States is doing good work in inducing the native planters to adopt modern ideas in growing rubber. It has recently caused to be translated and printed in Romanized Malay a paper on the thinning out of rubber plantations, which is being circulated for the benefit of native holders of small plantations. The subject treated in this paper is one of the most important affecting small holdings in the Malay Peninsula where rubber trees were first planted very close together, generally 10, 12 or 14 feet apart. Experience has proved that such plantings were much too close. Most of the large estates with closely planted areas are beginning to thin them out, to reduce the total number of trees to about 100 per acre.

The paper above referred to advises that in planting new areas, distances apart should not be less than 20 feet, which would total but 108 trees to the acre. It is further stated that time will probably show that 25 feet by 25 feet, or 70 trees per acre, is a better plotting for planting rubber trees.

It is explained that trees that are closely planted have too small a leaf area, and are much more liable to attacks of disease. When tapping commences they are still further weakened, and, therefore, the renewal of bark is not vigorous, this renewed bark being so thin that it is impossible to tap the trees without wounding after the original bark has been consumed.

Citing benefits obtained by thinning out, the paper says that the trees are much healthier, yield more rubber, and renew their bark quicker. It has been found that after thinning out, many trees will yield double the amount of rubber, and not only that, but the quality is improved, for it is argued that labor is reduced and it follows that if the yield per tree is doubled, a less proportion of scrap will be obtained when only half the number of trees is being tapped. Again, if the number of trees is reduced, there will be a large saving on tapping equipment, as a less number of cups and spouts will be required to bring in the same amount of latex.

All this is clearly explained and illustrated in plain, simple language which native holders can easily understand.

Advising as to the best method of thinning out, the paper says that, first, all small, weakly trees, which are very backward in appearance, should be removed because their stunted growth is sure to make of them very poor yielders of rubber. The process of selection and elimination should next concern trees which have a very irregular growth, such as bad trunks and forked branches, which are liable to be split by winds. After these have been exhausted it may be found necessary to cut out a number of good trees in order to improve the spacing of those which remain.

If trees in the area to be thinned out have not reached the tapping stage, they should be reduced to 100 trees per acre immediately, but if they are producing it should be carried out gradually at intervals of, say, six months, so that any drop in yield will not be apparent. Trees should be cut out completely and roots extracted and burned in order that no disease may attack the dead stumps. To tap stumps to death is unprofitable because of the small margin left by the present price of rubber.

The drop in the yield of an area in process of thinning out is only temporary and after a period of six to twelve months the yield per tree increases and makes up for the trees which have been removed.

When trees are very closely planted the yields fall rapidly when tapping renewed bark is commenced, and while close planting may have shown good profits with rubber selling at high prices, today the margin of profit is very small, and

the maximum yield per tree must be obtained to keep down the expense of collecting.

The longer thinning out is delayed the more difficult is the work, and the longer will the remaining trees take to increase their yields, and the lower will be the ultimate profits per acre.

COMPOSITION OF AN OLD RUBBER TREE.

AN ANALYSIS has been made, by M. Kelway Bamber, of a rubber tree 11 years old, measuring 34 inches in circumference at 3 feet from the ground. It was cut before leaf fall began. The trunk weighed 820 pounds and the branches and leaves 305 pounds; total 1,125 pounds. The trunk and branches were burned separately and yielded 0.445 per cent and 2.54 per cent of pure ash respectively. The total ash was 11.4 pounds, equivalent to 1.01 per cent on the whole tree. The total ash in 100 trees per acre would be 1,140 pounds, all of which has been taken up from the soil, and partly from the annual leaf-fall during 11 years' growth. The ash consists chiefly of carbonates and phosphates of lime, potash and soda. The phosphoric acid is about one-third of the lime, and one-half the potash content. The average percentage of soda is higher than the potash, which is unusual, and would indicate a deficiency of available potash in the soil in which the tree was grown. The table shows the composition of the ash as to its chief constituents:

Ash Constituents.	Wood, Per Cent.	Branches and Leaves, Per Cent.	Average, Per Cent.	Total per acre 100 Trees, Pounds.	Average Absorbed Annually, Pounds.
Lime	21.30	0.00	2.09	25	2.5
Magnesia	6.04	6.77	6.40	73	6.6
Potash	14.96	10.24	12.65	144	13.1
Soda	14.79	15.69	15.24	174	15.8
Phosphoric Acid, ..	7.80	6.53	7.16	81	7.3
Sulphuric Acid, ..	2.88	2.54	2.71	31	2.8

Dry rubber contains only about 0.32 per cent ash, and 400 pounds per acre would only remove about $1\frac{3}{4}$ pounds of mineral matter, a quantity that is negligible.

PREPARATION OF RUBBER IN FRENCH AFRICA.

THE following translation from a circular addressed by the lieutenant-governor of the French Ivory Coast Colony to subordinate administrative officers is of interest:

Auctions recently held at railway terminals clearly demonstrated the fact that prices obtained for lots of rubber depended solely on the methods by which the rubber was prepared. Thus, fine quality vine rubber sold at 494 francs per kilogram [about \$0.43 per pound] and *Funtumia* rubber that was well prepared brought as high as 470 francs per kilogram [about \$0.40 per pound], whereas, poorly dried rubber brought only 380 francs per kilogram [about 33 cents per pound].

Therefore, you must oblige the natives to prepare their rubber properly and handle it carefully right up to the market day.

In this connection I wish to recall to your attention that the object of having rubber prepared in slabs is not merely to prevent fraud, i. e., by mixing foreign matter with the rubber. The slab form makes it possible: first, to thoroughly wash the rubber and eliminate all soluble impurities; second, to dry it easily and rapidly.

The latter operation should be pushed as far as possible. The increase in value is always worth the additional trouble.

Drying should be performed in the shade, in a well ventilated place. Slight smoking will help to preserve the dry slabs.

The principal deterioration of rubber is a decomposition or oxidation, which is favored by high temperatures. Well prepared rubbers, and especially vine rubber, are rarely subject to this form of decomposition; however, climatic conditions here are not favorable to the preservation of crude rubber, which should be delivered to the export houses as soon as possible after its preparation.

When, for any reason, the natives are obliged to hold their rubber, they should be instructed to store it in dark, cool, dry

places, where they should pile it up to reduce to a minimum the surfaces exposed to the air.

To recapitulate, you should constantly see to it that rubber be carefully prepared. Careful preparation is essential to maintaining quality and prices, which under the present circumstances, are of an importance you can readily realize.

ANNUAL MEETING OF MALACCA PLANTERS' ASSOCIATION.

THE annual general meeting of the members of the Malacca Planters' Association was held in Malacca, Malaya, on February 22.

LABOR DIFFICULTIES.

Reviewing the past year, the chairman stated that 1915 had been a particularly trying year for the planters on account of the shortage of labor, which threatened to become serious and was acutely felt towards the middle of the year. This shortage was due to the repatriation of a large number of coolies to China when the war broke out and to the total cessation of immigration from both India and China for several months. The government did not grasp the situation until it was assuming a serious aspect, not only for the planting, but also other industries in Malacca and, when matters were remedied, considerable time had elapsed before any appreciable improvement in the flow of immigration took place, with the result that matters became very serious for many estates.

RUBBER PROSPERITY.

The year 1915 had been one of great prosperity in Malacca. The increase in the price of rubber during the year, although perhaps anticipated to a certain extent by a few, came as a pleasant surprise to the majority, and resulted in a small land boom in Malacca. Rubber was being planted throughout the length and breadth of Malacca by small native holders.

The area under rubber in 1915 showed an increase of 17,262 acres as compared with the area in 1914, the figures being, 1914, 114,845 acres; 1915, 132,110 acres. Other forms of cultivation had remained more or less stationary.

NATIVE RUBBER.

The chairman's opinion was that a large proportion of the 17,000 odd acres of rubber planted in 1915 had been planted by natives, and he believed that the extensive planting of rubber by small holders should be viewed with concern by those interested in the future of rubber in the country. Apart from the question of rubber thefts, which were serious enough in their own way and many of which were probably traceable to small holders, the industry was facing the possibility of an outbreak of disease which, if it started in small holdings, might go on unchecked until it would become well established, and prove serious.

Upon investigation, it had been found that there were many small holdings on which trees had been tapped too young, and were therefore weakened and likely to be ready subjects for any form of disease that might appear. This matter should engage the serious consideration of the government, because the prosperity of Malacca depends mainly upon agriculture and particularly on the rubber industry. A conception of the importance of the latter could be formed by examining the export figures for 1915, which showed that the exports of plantation rubber from Malacca amounted to 202,901 piculs [27,052,790 pounds], valued at 24,506,929 Straits Settlements dollars [\$13,723,880]. Of these, 17,737 piculs [2,364,874 pounds], valued at 1,960,876 Straits Settlements dollars [\$1,098,091], were imported, making the net production of Malacca, 185,164 piculs [24,687,916 pounds],

equal to approximately 10,994 tons, an increase of 4,228 tons over the 1914 figures.

RUBBER THEFTS AND DEALERS' ORDINANCE.

A matter of much importance, which had engaged the attention of the association during the year and was still billed for further discussion, was the question of rubber thefts. The evil was widespread and had reached proportions which were not realized by the government.

The rubber dealers' ordinance came into force in 1910 and was made to deal with the serious evil of rubber stealing. The original proposal of the association was that licenses for rubber dealers should be given out on certain specified days, appointed just as the liquor licenses now are granted, to give planters who so desire an opportunity to oppose the application. This proposal had already been passed. Then it was suggested that every cultivator of rubber should have a license to trade. In the chairman's opinion, the present ordinance did not go far enough. It should be in book form and every transaction made should be endorsed on the license. The association also desired that on this license should be noted the acreage under cultivation, the acreage which was being tapped, and the probable amount of rubber which was to be produced in that area, the latter to be estimated by a competent authority. There were difficulties to be met in the estimates of production. There were cases proved in Malacca in which men disposed of rubber in amounts that were absolutely ridiculous when the acreage under their cultivation was considered. The association desires to assist the magistrate, and it is for the government to so amend the law that certain rubber may be considered as stolen until it has been proved by the defendant to the contrary. The license should have a photograph of the dealer, and also the license of the seller should be produced. The majority of the sales of rubber by their tappers were made to small holders adjoining the larger estates. Rubber stealing has been worse since the ordinance came into force, and it is necessary to devise more efficient means for controlling the dealers who purchased stolen rubber up country. The association feels that the rubber industry, which pays a large and increasing revenue to the government, is worth being protected by the latter.

Replying to the chairman, the local representative of the government, who was present at the meeting, said that since the rubber dealers' ordinance had come into operation in 1910, the production of rubber had probably increased 200 per cent, but "the total volume of theft might not be greater." European managers did not attempt to give annual returns, as called for by the ordinance. Rubber is one of those commodities difficult to identify, and under the system of laws which obtain in the colonies and throughout the British Empire proof is needed before any man could be convicted. The chairman was a potential receiver in many of these cases. The local representative suggested that efforts be made to seize the thief on the estate, so that identification of the goods might be easier. To this the chairman rejoined that the police have pronounced it disheartening to take any cases under the rubber ordinance, 50 per cent of such cases being discharged. It was voted that suggestions be forwarded to the governor.

DAMAGE TO RUBBER TREES BY PORCUPINES.

Rubber planters in India complain of damage done to their *Hevea* trees by porcupines. Several remedies have been tried, with indifferent success. It has recently been found that whitewashing the trees up to a height of two feet from the ground protects them from attack by these animals. During the rainy season the whitewash is liable to be washed off, but it is said that this inconvenience can be overcome by mixing gum with the lime.

THE RUBBER SITUATION IN BRAZIL.

By Our Regular Correspondent.

CONDITIONS here continue to be most favorable. The prevailing rubber prices, though substantially lower than in the first days of the year, are still remunerative, even for those collecting their rubber in the most remote districts of the upper Amazon and, as little of this season's crop has been sold ahead, the people here have good prospects of reaping the full benefit of the present heavy demand. There will be real prosperity, both in Para and Manaus, if the entire crop can be sold while prices hold at their present level, and this crop will probably be a large one on account of the thousands of men that have been driven from their homes by the drought and famine in the State of Ceara and who are now employed in gathering rubber in the states of Para and Amazonas. These new rubber gatherers are, of course, unskilled and, though they certainly will increase our rubber production, they may also do great harm to the trees.

The once rich rubber districts on the Rivers Solimoes and

Purus are said to be now abandoned, having been completely exhausted. In the islands around Para the trees are being literally tapped to death.

There are millions of rubber trees untapped in our vast forests. The difficulty and travel necessary to opening new *estradas* have led our native gatherers to visit the same *seringaes* year in and year out with the result that the exploited trees have been tapped to their limit. Once the lower bark has been tapped until it is useless, crude ladders are used to reach higher parts of the trees to practice "overhead" tapping, which is pushed as high as 30 and more feet above the ground. The relative abundance of labor we are now enjoying is leading to the opening of new *estradas* and exploitation of new *seringaes*. Fresh trees yield greater quantities of latex than trees that have been visited for years, and this exploitation of new sources may well account for the low prices at which our rubber can now be produced.



OVERHEAD TAPPING.

GERMAN PURCHASES.

Reports are current here that German interests have purchased about 5,000 tons of crude rubber in this country for delivery after the war. These purchases are said to have been paid for in gold, and their object is believed to be to make sure of a supply for a time when Germany might still find difficulty in purchasing through British concerns as she was doing before the war.

RUBBER DEALERS AFFECTED BY BRITISH "BLACK LIST."

Among the names of German and Austrian concerns established in Brazil which have been placed on the "black list" by the British Government are those of the following rubber dealers and exporters: Ohliger & Co., Para and Manaus; Pralow & Co., Manaus; and Semper & Co., Manaus. The effect of being black-listed is that these concerns are barred from shipping in British bottoms and from trading with British concerns. They can continue to do business with neutral countries and to ship their goods in neutral bottoms. As British steamship lines alone make

regular calls at Para and Manaus under present conditions, this blacklisting is a very serious matter for the firms concerned and it is said that attempts are being made by them to avoid these difficulties. An attempt was made to have the Brazilian Government interpose in the matter, but it has been intimated that in case of too great agitation the British Government would go so far as to withdraw British steamers altogether and Manaus would be reduced to dependence on the irregular service neutral shipping now offers.

IMPORT AND EXPORT DUTIES.

Our budget law for 1916 went into effect on January 1. It included no changes in the import or export duties on manufactured rubber. In fact, there are no duties at all on exports of manufactured rubber. As to the duties levied by our several rubber-producing states on exports of crude rubber, the only recent change in such duties is that prescribed by the government of the State of Manaus, in a decree dated June 12, 1915, which provided for an export tax of 7 per cent ad valorem on rubber produced in the territory of the Javary river and its Brazilian tributaries.

DISCRIMINATING DUTY REPEALED.

The Budget law for 1916 definitely repealed the provision in the budget law for 1915 for reduced rates on articles made of Brazilian rubber. It will be recalled in this connection that the 1915 law called for discriminatory duties on articles made of rubber of foreign origin, but neither the higher nor the lower rates applicable to rubber goods have actually been imposed since the early part of 1915, owing to the impossibility of distinguishing, in the manufactured goods, between Brazilian rubber and other sorts.

A change that will affect all dutiable imports, rubber goods included, is the increase in the proportion of import duties payable on a gold basis from 35 to 40 per cent, which will result in some increase of duty.

AMERICAN MANUFACTURERS FAVORED.

On January 14, 1916, the President of the Republic signed a decree that will continue the preferential treatment which has heretofore been allowed to products and manufactures of the United States, including manufactures of rubber on which the preferential reduction is 20 per cent. This is an important advantage to American tire manufacturers, many of whom are sending large quantities of their goods to this country.

PLANTATION PROPAGANDA.

We Brazilians continue to witness with indifference the efforts London rubber plantation interests are constantly making to lead manufacturers to believe that their best plantation sorts are superior to our Upriver fine Para. The indolence of our people in this connection is without excuse. It is not sufficient that we know our rubber to be the best of all. It is high time for taking measures to protect our interests and, at the same time, those of manufacturers. We should not allow these manufacturers to be misled by the incessant and well-planned propaganda of our chief competitors. We, too, should spend some money in exploiting the superiority of our native rubber for many manufactures. When will our authorities awake to this necessity, and when will they reduce our excessive export duties and thus help to place our rubber producers in a better position to meet plantation competition? I am sorry not to be able to answer.

CHANGE IN A BRAZILIAN RUBBER EXPORTING CONCERN.

A new rubber trading company has been chartered in this country to take over the export business heretofore carried on by Schnack, Nueller & Koehn, at Coromaba, in Matto Grosso, at Puerto Suarez, Bolivia, and at other important points. The legal headquarters of this company are at Hamburg, Germany.

Hevea in British Guiana.

NEWS from the biggest and potentially the best *Hevea* plantation in British Guiana is sure to be interesting, not alone to the American projectors but to all users of crude rubber.

For various reasons it has been felt that the Far East was alone adaptable for *Hevea* planting. Indeed, when some six years ago a great tract of land up the Mazaruni River was acquired and clearing begun, many experts were honestly doubtful about the ultimate success of the project. It, however, was not abandoned. On the contrary, under the intelligent management of a man well versed in tropical planting, land was cleared, seed brought in from the Malay states, and more than a thousand acres successfully installed.



THREE-YEAR-OLD HEVEAS, WINTERING.

The illustrations herewith give glimpses of most satisfactory accomplishment. The growth of the trees has been fully equal to that in any part of the world. There are no more diseases, leaf or root, the rainfall is ideal, and the land is so situated that high winds are unknown. Last, and most important, labor is cheap and abundant. Incidentally, very comfortable administration buildings have been erected. So comfortable are they and so delightful is the climate on the Mazaruni River that Colonel



MOIST ROAD IN THE PLANTATION.

and Mrs. Roosevelt, who visited British Guiana this winter, made their whole stay at "The Hills," which is the headquarters of the Bartica Agricultural States plantation.

Regarding the plantation's progress, an extract from a letter written by George B. Withers, the manager, is of interest.

As you know, I bought some glass cups for tapping purposes last December, and expected them here just after I returned in January, and I waited and waited, but they did not come, so I started to tap 312 trees, as that was all the cups I had, and for ten weeks I have been tapping that number, we have had the



FIVE-YEAR-OLD HEVEAS.

usual dry weather, but they have been running well all the time. Then, as I heard last week of somebody who had some of the latest earthenware cups for sale I bought 1,000, which arrived here two days ago, and by the very same boat that brought these up to me, I had a letter from town saying the glass cups had arrived there at last; however, they will all come in handy soon.

The results of the tapping as far as I have been able to weigh so far, are as follows: Each 14 days' product is kept separately



TAPPING FIVE-YEAR-OLD HEVEAS.

and weighed as soon as dry, and as the weather has been very dry, we have now got weighed up the first four fortnights.

The following is the result from 312 five-year-old trees:

	Biscuits			Scrap, etc.			Total			Wet Rain.	
	Lbs.	Ozs.	Drs.	Lbs.	Ozs.	Drs.	Lbs.	Ozs.	Drs.	Days.	Inch.
First 14 days.....	31	10	18	3	15	12	34	25	30	4	8
Second 14 days.....	23	3	18	3	9	3	26	12	13	10	2.52
Third 14 days.....	34	9	18	6	3	12	40	5	4	9	2.59
Fourth 14 days.....	28	14	12	6	15	14	34	14	10	5	2.57
	112	15	8	22	14	9	136	14	1	32	8.47

At the above rate this would give an average of 3 pounds, 4 ounces, 4 drams per tree for the year, which we certainly ought to improve on considerably, and the above tapping in the first fortnight includes all the very first cuts, from which, as you know, much is not given in the way of latex. Also this tapping has been done during the very worst time of the year that we have in regard to rainfall so that I hope, and expect that we shall average for the year a good deal more than the above would average, and this for five-year-old trees, I think you will agree is very good indeed.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED APRIL 18, 1916.

N 1,179,547. Association box with rubber buffers. W. Keller, as assigner F. Krupp Aktiengesellschaft—both of Essen-on-the-Ruhr, Germany.

1,179,552. Hose coupling and mender. L. R. Nelson, Peoria, Ill.

1,179,652. Safety heel with rubber parts. A. C. Rightor, Pittsburgh, Pa.

1,179,653. Rubber vehicle wheel tire. R. M. Roberts, assignor to F. T. Barber—both of Anderson, Ind.

1,179,654. Safety valve for tires. E. W. Shewmaker, assignor of twenty one-hundredths to M. D. Lawler and twenty one-hundredths to W. B. Schlottman—both of San Francisco, Calif.

1,179,655. Fluid hose. W. F. Bowers, San Francisco, Calif.

1,179,656. Emergency chain attachment for automobile wheels. L. E. McKinnon, Buffalo, N. Y.

1,179,657. Solid tire with coil spring. W. Murry and J. Conway, Shrewsbury, Mass.

1,179,658. Resilient tire. C. A. Smith, Wellesville, N. Y.

1,179,659. Spring wheel with rubber tire. F. D. Stuart, Douglaston, N. Y.

1,179,660. Resilient tire with rubber abutments. S. F. Millard, Norwalk, Conn.

1,179,661. Textile fabric glove having the palm surface and finger sections impregnated with a rubber composition. J. P. St. John, New Haven, Conn.

1,179,662. Cushion tire for vehicles. J. F. White, Pittsburgh, Pa.

1,179,663. Hose support. C. J. Hausen, New York City.

1,179,664. Tense post for vulcins comprising a rubber part. H. Edwards, Downsville, N. Y.

1,179,665. Means for clearing waste pipes. G. Petersen, Spokane, Wash.

ISSUED APRIL 25, 1916.

1,180,523. Force cup. C. F. Schuh, Newark, N. J.

1,180,524. Tire fastener for wheels. H. T. Dunbar, Buffalo, N. Y.

1,180,525. Tire fastener. I. R. Gammett, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.

1,180,526. Device for shaving preparatory to shaving. W. A. Gatten, New York City.

1,180,527. Self-filling fountain pen. E. G. Peck, Seymour, Conn.

1,180,528. Means for vulcanizing punctures in rubber tires. S. I. Rose, assignor to Marvel Accessories Manufacturing Co.—both of Cleveland, Ohio.

1,180,529. Rubber boot. A. H. Steen and H. McNulty, Berlin, assignors to Canadian Consolidated Rubber Co., Limited, Montreal—both in Canada.

1,180,530. Gear. F. A. Headson, assignor to H. W. Johns-Manville Co.—both of Milwaukee, Wis.

1,180,531. Locking ring for tires. H. Kappan, assignor to Long Manufacturing Co.—both of San Francisco, Calif.

1,180,532. Filler for vehicle tires. C. M. Nevins, Frontier, Mich.

1,180,533. Retainer for rubber footwear. J. H. Brackin, Newark, Del.

1,180,534. Tire. R. B. Wilson, Los Angeles, Calif., assignor to Albert Behrend and Joseph Rothschild, composing the firm of Behrend & Rothschild, New York City.

1,180,535. Method of producing waterproof coatings of balata on objects which are influenced by humidity. M. Dickert, Verne, Germany.

1,180,536. Method of patching hose and tool therefor. R. C. Hall, Lexington, Ky., assignor to H. Hall administrators of said R. C. Hall.

1,180,537. Rubber hose bulb for spraying of flushing devices. J. A. Mulherin, St. Louis, Mo.

1,180,538. Waterproof life-saving appliance. I. Gilbert, Chicago, Ill.

1,180,539. Fountain pen. T. Tanimura, Rock Springs, Wyo.

1,180,540. Device for repairing punctures. C. B. Drake, Norfolk, Va.

1,180,541. Self-filling fountain pen. F. Riesenber, assignor to L. E. Waterman Co.—both of New York City.

1,181,001. Waterproof sheet attachment for bed pan. J. C. Griesel, assignor of one-half to W. F. Doyle—both of Pottsville, Pa.

1,181,002. A wheel for cars comprising a removable tire of solid rubber. D. W. Weisacker and F. Greiner, Fulton, Germany.

1,181,003. Hose coupling. R. Bennett, Beacon, N. Y.

1,181,004. Elastic rubber inner liner for pneumatic tires. P. T. Coffield, Dayton, Ohio.

1,181,005. Puncture proof tire. J. C. Fair and T. A. Anderson, Chicago, Ill., assignors to Premium Punctureproof Tire Co., a corporation of Maine.

1,181,006. Demountable rim for wheels. I. D. Walter, assignor of fifty-three one-hundredths to J. R. Brinkerhoff, one-tenth to R. F. Cole, one-tenth to T. Flournoy, one-fiftieth to J. W. Gant, one-twentieth to J. G. Gant, and one-fiftieth to S. A. Latimer—all of Harrisburg, Ark., and one-tenth to C. B. Bolley, Wynne, Ark.

1,181,007. Wheel rim for pneumatic tires. J. H. Fawkes, Portland, Oreg.

1,181,008. Fountain pen. E. Winne, New York City.

1,181,009. Tire and metal plug for rubber heels and sole shoe surfaces. J. Rosenfeld, Lowell, Mass., assignor to Boston Rubber Manufacturing Co., Boston, Mass.

ISSUED MAY 9, 1916.

1,182,162. Tool for use in the manufacture of shoes comprising a pad of untensioned spongy rubber. F. M. Furber, Revere, Mass., assignor to United Shoe Machinery Co., Paterson, N. J.

1,182,163. Pad garter. C. A. Hamlin; F. E. Lipscombe—both of Auckland, and H. Spencer, Hamlin, Wellington—all of New Zealand, administrators of said C. A. Hamlin, deceased.

1,182,227. Bridle having an electric strip between the brow band and blinders. M. J. Stephan, Nortonville, Kans.

1,182,246. Penholder having an expandible and elastic rubber sleeve. W. S. Bridges, Chicago, Ill.

1,182,257. Storage battery. F. Engel, Buffalo, assignor to U. S. Light & Heat Corporation, Niagara Falls—both in New York.

1,182,262. Sanitary skirt shield. N. H. Fose, Appleton, Wis.

1,182,297. Tire. A. D. Morris, Philadelphia, Pa.

1,182,341. Tire comprising an elastic strap. W. T. Bobo, assignor to The Tire Trust Co.—both of Battle Creek, Mich.

1,182,357. Method of constructing pneumatic tires. F. S. Dickinson, New York City.

1,182,433. Resilient pneumatic wheel, which comprises a resilient element surrounding the hub. C. D. Stacey, Philadelphia, Pa.

1,182,434. Pedal pad. F. J. Mason, assignor of one-half to S. E. Allen—both of Los Angeles, and one-half to J. C. Rice, San Diego—both in California.

1,182,460. Tire. W. E. Supernaw, Elgin, Ill.

1,182,461. Golf ball. F. L. O. Wadsworth, Sewickley, Pa.

1,182,462. Golf ball. F. L. O. Wadsworth, Sewickley, Pa.

1,182,463. Pneumatic tire. W. B. Buckley, Washington, D. C.

1,182,464. Combined non-skid and traction device for dual tire wheels. M. H. Cleaver, assignor to Neverskid Manufacturing Co., Inc.—both of New York City.

1,182,469. Outsole of a rubber shoe adapted for conservation in the wear of rubber soles. J. I. Flaherty, Springfield, Mass.

1,182,498. Tire patch. J. G. Mooney, Erie, Pa.

1,182,499. Tire liner. J. G. Mooney, Erie, Pa.

1,182,500. Life saving suit. M. A. Czerkas, Philadelphia, Pa.

1,182,504. Anti-slip underlay for rugs, comprising a sheet of duck having one face treated with rubber. E. W. Harral, Bridgeport, Conn.

1,182,505. Bath appliance. C. E. Stalter, Detroit, Mich.

1,182,506. Non-slip rubber attachment for the soles and heels of boots or shoes. J. H. Turner, Alton, England.

1,182,507. Inflatable tire. H. C. Boges, Detroit, Ala.

1,182,508. Bowling pin, the body of which consists of a composition of hard vulcanized rubber. M. J. Whelan, Muskegon, Mich., assignor to The Brunswick-Balke Collender Co., Chicago, Ill.

[Note.—Printed copies of specifications of United States patents may be obtained from THE INDIA RUBBER WORLD office at 10 cents each, postpaid.]

THE DOMINION OF CANADA.

ISSUED FEBRUARY 29, 1916.

167,359. Tire tread. D. B. McKinnon and A. Bowser, both of Winnipeg, Man., Canada.

167,360. Dust cap for valve stems of tires. G. F. Fisher and A. Bailey—both of Plainfield, New Jersey.

167,361. Dust cap for valve stems of tires. E. L. Aiken, Springfield, Mass.

167,362. Massage appliance. C. H. Archibald, East Las Vegas, New Mexico.

167,363. Fish bait box with elastic front section. P. Lamb, Denver, Colo.

167,364. Tire forming strip. J. T. Lister, Cleveland, Ohio.

167,365. Tire for tire casings. J. D. Tew, Akron, Ohio.

167,366. Shoulder rest for violins secured to the instrument by elastic bands. B. Poehland, Brooklyn, N. Y.

167,367. Safety valve for tires. J. Ruhl, Winnipeg, Manitoba, Canada.

167,368. Laminated fabric. L. A. Subers, Cleveland, Ohio.

167,369. Cord for tire casings. J. D. Tew, Akron, Ohio.

167,370. Composite sole having a tread portion of rubber. The Williams-Kneeland Co., South Braintree, Mass., assignee of W. F. Baskette, Providence, R. I.

167,371. Chain. M. Bodenstein, Rochester, N. Y.

167,372. Tire and pressure gauge. O. R. Bromberg, San Diego, Calif.

167,373. Triangular-shaped rubber cushion for game tables. The Brunswick-Balke-Collender Co., assignee of M. J. Whelan, Muskegon, Michigan.

167,374. Valve for tires. M. J. Payne, Staunton, Va.

167,375. Pneumatic tire. H. Jancovitch, Pittsburgh, Pa.

167,376. Tire. H. M. Lambert, Portland, Oregon.

167,377. Tire comprising a composition of vulcanized rubber, a covering of rubber. E. E. Wellen, Christiania, Norway.

THE UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent upon the filing of the application.

*Denotes Patents for American Inventions.

- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, APRIL 12, 1916.]
- 24,000 (1915). Razor strap having a rubber end piece. G. H. De Naveene, 28 Avenue Bisquet, Paris.
- 24,105 (1915). Waterproof sleeping bag and marine life preserver. M. A. Campt and R. A. J. Any, 10 Clifford street, and F. C. Bacon, 29 Portland street, all of London.
- 24,124 (1915). Spring wheel with pneumatic tire. J. Gonzalo Y Garrido 44, Gran Via, Barcelona, and E. R. De Dampierre, 8, Hornosilla, Madrid.
- 24,128 (1915). Crutch with armful air cushion. F. A. Pennington, 10, Halesden Road, Heaton Chapel, Stockport, Cheshire.
- 24,164 (1915). Rubber mats, stair nosing, and treads. A. L. Neeson, 52, Old Bailey, London.
- 24,208 (1915). Over-shoe. A. Johnston, and North British Rubber Co., Castle Mills, Edinburgh.
- 24,261 (1915). Figure having rubber base for use in table games. H. P. Robbie, 154, Perth Road, Dundee.
- 24,270 (1915). Life belt comprising rubber chambers containing gas forming chemicals. A. P. Rows and F. E. Nedrey, 9 Grand Parade, Muswell Hill, London.
- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, APRIL 19, 1916.]
- 24,441 (1915). Rubber grips for electric goods. R. J. Quinlan, 53, Clarendon Road, Putney, London.
- *24,448 (1915). Shirt with elastic gussets in the neck band. A. Bernstein, 31, North State street, Chicago, Ill.
- 24,499 (1915). Demountable rim. A. G. De Grey and Auto Sundries, Ltd., 10a, Lower Grosvenor Place, London.
- *24,559 (1915). Rubber faced metal shields for camera and like supports. W. H. Klenck, Warren, Pa.
- 24,569 (1915). Vehicle wheel with interior pneumatic cushions. G. R. Taylor, 373, Bath street, and R. Whyte, Reid street, Bridgeton—both in Glasgow.
- 24,570 (1915). Means for opening and closing the sliding lights of windows comprising a rubber lined bar. J. S. Bedford, 61, Park street, Blakenhall, and J. A. Cooper, 103, Owen Road—both in Wolverhampton.
- 24,586 (1915). Rubber tube in spinning apparatus for yarn winding. W. Lister, 68, Castle street, Nelson, Lancashire.
- 24,624 (1915). Apparatus for restoring respiration. R. H. Davis, 187, Westminster Bridge Road, London.
- 24,680 (1915). Treatment of rubber latex. S. Milne, 11a, George street, Edinburgh. [See THE INDIA RUBBER WORLD, November 1, 1915, page 64.]
- 24,683 (1915). Spring wheel with continuous outer rigid ring and rubber ring and like cushions. P. F. Dundon, San Francisco, California.
- 24,752 (1915). Hard rubber tires provided with a number of concentric rows of transverse ribs filled with softer rubber. R. K. Hearn, The Downs, Wimbledon, London.
- 24,815 (1915). Filter for attachment to a suction pipe for field service comprising a nozzle of rubber. W. Brookes, 28, Addison Road North, London.

- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, APRIL 27, 1916.]
- 46 (1915). Metal and rubber tread bands for tires. R. von Krenski, 25, Avenue de la Paix, Paris.
- 56 (1915). Combination tent, ground sheet and cape. G. H. Dale, 3 Waltham, Cape of Good Hope.
- 126 (1915). Combination sole of rubber and cork. E. C. R. Marks, 57 Lincoln's Inn Fields, London.
- 146 (1915). Tread band for twin tires. A. J. Law, 29 Southampton Buildings, London.
- 147 (1915). Exercising apparatus, the links of which are composed of elastic cords. E. Sandow, 379 St. James street, London.
- 157 (1915). Non-inflatable rubber tire. W. E. Kerslake, 8 Mill Lane, West Derby, Liverpool.
- 173 (1915). Rubber tired spring wheel. R. Greenwell, Huntly, Auckland, New Zealand.
- 206 (1915). Puncture repair band for tires. W. Allen, 22 Broad street, Seaford, Sussex.
- 222 (1915). Inflating valve for use with pneumatic life saving apparatus, sponge substitutes, and polishing pads. J. H. Devlin, 11 Johnson street, Notting Hill, London.
- 240 (1915). Removable non-slip rubber treads for horsehoes. F. Sheppard, Coach Works, Temple street, Swindon, Wiltshire.
- 285 (1915). Rubber cap for reservoir gum bottle. H. J. Visek, 5 Rankoon street, Fenchurch street, London.
- *288 (1915). Attaching artificial teeth to vulcanize plates. F. H. Nies, 859 Bay Ridge avenue, Brooklyn, and J. F. Caretto, Baldwin—both in New York.
- 100,068 (1914). Single tube pneumatic tire. C. A. G. Deterting, The Hague.
- *100,101 (1914). Method of forming used tire casings. F. S. Dickinson, 233 Broadway, New York City.
- *100,102 (1914). Hose comprising an outer covering and a removable rubber inner. R. Mayo, 127 Duane street, New York City.
- *100,108 (1914). Rubber packing washer for dust caps of pneumatic tire valves. H. P. Kraft, 239 Graham avenue, Ridge-wood, N. Y.

- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MAY 3, 1916.]
- 323 (1915). An appliance for treating foot rot in sheep, comprising a rubber boot molded to the shape of the hoof. C. Liddiard, 27 Somerset Road, Frome, Somersetshire.
- 365 (1915). Rubber faced target practice apparatus. W. J. Mellersh—Jackson, 28 Southampton Buildings, London.
- 362 (1915). Rubber impeller vanes and other rubber parts for centrifugal and turbine pumps, etc. R. C. Parsons, 39 Victoria street, London.
- 444 (1915). Wheel tires. F. Heemann, Bremen-Horn, Bremen, Germany.
- 518 (1915). Hair curling appliances comprising rubber bands. H. E. Marvel, 534 Oxford street, London.
- 603 (1915). Brushes, having their bristles set in vulcanizable material. Rubber Set Brush Co., 21 Bucklebury, London, and A. H. Jucums, Fairmount, Harrow View, Harrow, Middlesex.
- 664 (1915). Air escape valves for discharging vitiated air from divers' helmets. R. H. Davis, 187 Westminster Bridge Road, London.
- 665 (1915). Rubber faced portable track wheels. R. H. Fowler, H. Lissey, and H. Walker, Steam Plough Works, Leeds.
- *100,141 (1914). Rubber heel with metal insert. J. M. van Heusen, 101 Roxbury avenue, Jamaica Plain, Boston, Mass.

NEW ZEALAND.

ISSUED MARCH 16, 1916.

- 35,937. Postmarking machine with rubber band. R. M. Simpson, Wellington, N. Z.
- ISSUED MARCH 30, 1916.
- 35,914. Hose reel. L. J. Benington, and Geraldine, N. Z.
- 35,924. Milking machine test cup of rubber. H. Boesen, of "Eutoma," Sydney street, Willoughby, Sydney, N. S. W.
- 36,178. Milking machine test cup. H. R. Jenkins, of Eltham, N. Z.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

- 478,488 (April 23, 1915). Elastic tire for motor vehicles. A. Dreyer.
- 478,552 (April 29). Detachable wheel. Fernand Adolph Sauer.
- 478,579 (May 3). Improvements in the manufacture of tire casings. The Dunlop Rubber Co., Limited.
- 478,584 (May 4). Pneumatic tire. The rim is built so that its sides enclose the casing and the corresponding part of the inner tube in such a manner that the edges of the rim are above the average horizontal diameter of the inner tube, the unprotected part of the elastic casing is thus reduced to an arch considerably less than 180 degrees. The casing thus protected by the rim is now provided with beads and has on either side a heavy tube forming a puncture-proof rim. There are two flaps covering the part of the arch inside the inner tube. Hall, Behrens and Godet.
- 478,642 (May 8). Puncture-proof pneumatic tire. This tire consists of an air tube, a flexible casing, an intervening rigid sleeve, a certain number of plungers the ends of which are in contact with the intervening sleeve and thus transmit to the air chamber the displacements of the casing. Parts like annular plates and bolts hold the whole together on the rim of the wheel. J. A. Shearer.
- 478,648 (May 10). Elastic tire for vehicles. E. W. Price.
- 478,719 (December 21, 1914). Pneumatic tire for vehicle wheels. G. W. Beldam and A. V. B. Ryall.
- 478,791 (May 22, 1915). Improvements in vehicle wheels and tires. L. Linde.
- 478,806 (May 26). Improved nipple with one or more non-elastic ribs embedded in the rubber at certain distances from the edges, preventing the nipple from collapsing. W. A. Kokke.
- 478,819 (May 27). Improved anti-slip devices for pneumatic tires. V. Goretzki.
- 478,826 (December 1, 1914). Improvements in elastic tires. Deall and Brooks.
- 478,892 (June 2, 1915). Elastic wheel. Orsini and Artigas.
- 478,901 (June 3) Splash guard for vehicles. H. Flad.

TRADE-MARKS.

THE UNITED STATES.

- 89,692. C. A. Robinson, New York City. A circle within a circle, the space between the two circles being divided into three equal parts by two diameters at right angles to each other, and in the center three lines—two diagonal and one horizontal—forming a triangle, the apex of which is at the center.
- 91,501. Cumings Brothers, Flint, Mich. A triangle, surrounding the letter B within the letter C. For tire flaps or pads for use inside of rubber tires, etc., etc.
- 93,475. Williams-Kneeland Co., South Braintree, Mass. Representation of a composite structure of rubber and leather, etc., etc.
- 93,728. Gail, Davis & Shearer Co., Philadelphia, Pa. A boy in Dutch costume holding a tire and standing on a square with the words "Gail's Tires" in center.
- 93,211. Hart, Schaffner & Marx, Chicago, Ill. The word *Trumpeter*. For use on raincoats, etc.
- 93,039. Cohen, Goldman & Co., Inc., New York City. A design comprising tennis racquets, golf clubs, baseball bat and balls within a laurel wreath, beneath the word *Sportex*. For raincoats, etc.
- 93,209. Hart, Schaffner & Marx, Chicago, Ill. The words *Six Hundred*. For raincoats, etc.
- 93,210. Hart, Schaffner & Marx, Chicago, Ill. The words *Fifty-Five*. For raincoats, etc.

- 93,289. *Lee*. War maker, Philadelphia, Pa. The words *Lee* and *Star*.
 93,339. *Boston Rubber Shoe Co.*, Malden and Boston, Mass. An outline of a shoe with the word *Star* on it. For rubber footwear and combination of rubber, leather, etc.
 93,387. *D. Smith*, New York City. The words *Red Top* combined with the representation of a red spinning top. For a tire puncture sealing fluid.
 93,569. *Kassabady's Shoe Store*, Washington, D. C. The words *Footwear* and *Shoe Store*. For shoes made of leather, rubber, etc.
 93,368. *Lee Tire & Rubber Co.*, Whitmarsh township, Montgomery county, Pa. Illustration of a gray tread tire having two red side bands. For rubber tires and casings.
 93,443. *United States Tire Co.*, New York City. Illustration of a tire with a white side wall stripe. For rubber tires.
 93,617. *J. Floyd*, Savannah, Ga. Representation of a golf ball having an eye impressed thereon. For golf balls.
 93,704. *The Miller Rubber Co.*, Akron, Ohio. The word *Watermelon*. For toy balloons.
 93,715. *The Miller Rubber Co.*, Akron, Ohio. The term *Watermelon*. For toy balloons.
 93,716. *The Miller Rubber Co.*, Akron, Ohio. The word *Zip-efin*. For toy balloons.

THE DOMINION OF CANADA.

- 21,465. *Lee Horibut Co.*, Ltd., Preston, Ontario. The word *Playmate*. For rubber footwear.
 21,466. *Mishawaka Rubber Manufacturing Co.*, Mishawaka, Indiana. The word *Pac*. For rubber footwear, clothing, blankets, etc.
 21,500. *The F. F. Goodrich Co.*, New York City. Narrow red band around the upper portion of the rubber boot and shoe. For rubber footwear.
 21,541. *The F. F. Goodrich Co.*, New York City. The word *Horse*. For rubber footwear.

DESIGNS.

- 48,885. Rubber tire. O. P. Downing, Dallas, Tex.
 48,886. Rubber tire. A. Hargrave, assignor to the Firestone Tire & Rubber Co., Akron, Ohio.
 48,908. Elastic fabric. C. A. Lapworth, West Bridgewater, assignor to The Lapworth Webbing Co., Brockton—both in Massachusetts.
 48,905. Elastic fabric. C. A. Lapworth, West Bridgewater, assignor to The Lapworth Webbing Co., Brockton—both in Massachusetts.
 48,906. Rubber tire. C. O. C. Lindroth, Redfield, S. D., assignor to The Pharis Tire & Rubber Co., Newark, Ohio.
 48,920. Elastic vehicle tire. A. L. Breitenstein, Akron, Ohio, assignor to The Rubber Products Co., Earlerton, Ohio.
 48,932. Rubber pad for boots and shoes. H. P. Fouque, New York City.

CUSTOMS RULINGS.

Mention was made last month of the customs' decision that small rubber balloons with advertisements printed upon them were decided to be toys and duty appraised as such. A similar case has since been decided when Florent Bauwens of St. Louis imported a large number of these balloons upon which the names of various city parks were stamped. He contended that the entry should be allowed as india rubber manufactures calling for a duty of 10 per cent, but the board of general appraisers decided that they were subject to a duty of 35 per cent as toys or their parts.

As is well known, the audiophone is an instrument used by partially deaf persons to aid their hearing. It consists of a fan-shaped sheet of hard rubber attached to a suitable handle and with a cord so placed as to draw the fan into the shape of a sounding board. The collector claimed that these were fans and dutiable at 50 per cent, but the board of appraisers has reversed this ruling, being convinced that the article was not a fan in the generally accepted sense of the word and should not be classified as such. An entry was given at 25 per cent as manufactures of rubber.

At the Boston Custom House a protest was filed by Ashworth Bros., Inc., when the government claimed that the chief value in rubber-faced card cloth was the cotton in the fabric, and assessed duty at 30 per cent. It was shown that rubber was the component material of value, and the board accordingly admitted the cloth at a duty of 10 per cent.

A decision regarding raincoats is interesting. W. B. Hutchinson & Co., Seattle, Washington, claimed that as cotton wearing apparel the duties should be 30 per cent, but the collector claimed that they should be classified as wearing apparel composed wholly or partly of wool and dutiable at 44 cents per pound and 60 per cent ad valorem, and this decision of the collector has been affirmed.

JUDICIAL DECISIONS.

FEDERAL RUBBER MFG. CO. V. HAVOLIC—AND OTHERS.

Havolic worked for the plaintiff; his duties were to feed stock into a tubing machine. In this department there was a compressed air system with hose and nozzle. Employees were forbidden to use the hose for cleaning their clothes. Havolic knew of the prohibition, but one day disobeyed it. A fellow workman took the hose from his hand and playfully puffed Havolic with the nozzle, thereby injuring him so that he was totally disabled for 17 weeks. He sued under the Workmen's Compensation Act, and the case came before the Industrial Commission of Wisconsin, which made an award in favor of the claimant. The employer appealed to the Circuit Court. The award was confirmed and appeal was taken before the Supreme Court of Wisconsin, where the decisions were reversed, it being held that the Workmen's Compensation Act of Wisconsin was enacted to provide compensation for injuries sustained when the causative danger is peculiar to the work, and that the workman is not entitled to compensation for injuries that do not result from a causative danger of his employment. (156 Northwestern Reporter, 143).

AXAN-GRIEB RUBBER CO., v. HUBBARD.—The former brought suit against the latter on a verified account of \$586.04. Answering, the defendant pleaded in set-off a sum of \$267.50, the value of certain goods alleged to have been returned by him to the plaintiff and, by cross-action, sought to recover other amounts aggregating \$750. He agreed that \$376.12 of the plaintiff's claim was just and asked for judgment in the sum \$364.48, over and above the amount due by him to the plaintiff.

The trial court found for the plaintiff in the sum of \$115.54, which was less than the amount claimed, and the plaintiff appealed.

There being no statement of facts or finding of facts in the record of the case, the court of appeals held that it could not determine that the judgment on the contested issues was erroneous, nor could it review errors in overruling special exceptions to the pleadings.

The decision of the trial court must therefore be affirmed. (Court of Appeals of Texas, 181 Southwestern Reporter, 568).

IN RE DUNEY. IN RE REVERE RUBBER CO. IN RE AMERICAN MUTUAL LIABILITY INSURANCE CO.—Durney, an employee of the Revere Rubber Co., was injured on September 28, 1912. His average weekly wages were \$22. He was paid a maximum compensation under the statute, until September 7, 1914. On September 8, 1914, he returned to work, but was then partially incapacitated, his weekly wages only amounting to \$13.20. Had there at the time been no business depression, these wages would have amounted to \$15 per week. Durney was awarded partial compensation based on one-half the difference between his average weekly wages before the injury (\$22), and his average weekly wages since the injury (\$13.20). The insurer, the American Mutual Liability Insurance Co., appealed, and the Supreme Court of Massachusetts affirmed the award, holding, that under the Workmen's Compensation Act, providing that in case of partial incapacity the employee should be paid one-half the difference between his average weekly wages before his injury and the average weekly wages he is able to earn thereafter, no deduction from wages earned before the injury should be made because of business depression. The award should be based on difference between the wages the employee was actually earning before the injury and the wages he is able to earn thereafter, although if his wages are reduced because of a depression in the business conditions, the amount of such reduction should be ascertained and added to the wages the employee actually receives. (111 Northwestern Reporter 166).

Review of the Crude Rubber Market.

NEW YORK.

MAY has been a very dull, uninteresting period for the local importers and dealers in crude rubber. Early in the month the market developed an unsettled condition that reflected the dull tone of the London market. There was an absence of trading, due to the holders' reluctance to accept orders at prices that were under the market. Both buyers and sellers appeared to be awaiting some decisive development that would definitely change the monotonous tone of the market. Predictions that the bottom had been reached and a reaction was imminent were daily confuted by prices that continued to seek lower levels. This condition of general apathy on the part of traders and the steady decline of prices were the dominant features of the month. The factors that are controlling the market are not so well hidden that the fundamental causes cannot be, at least, surmised. For instance, there is a lot of rubber in sight; the manufacturers accumulated large stocks prior to April 1; the anticipated heavy spring business in tires has not materialized, due to the backward spring weather; and machinery for new equipment is being delivered very slowly. Everyone is confident that the bottom in prices has been reached and is waiting for the reaction that will follow.

New York arrivals for the first three weeks of May are 6,756 tons compared to 4,000 tons for the same period last month, and are as follows: Plantations from London and Liverpool, 2,720 tons; Singapore and Colombia, 1,117 tons; Batavia, Java, 575 tons; Para and Manaos, 1,875 tons; Africans, 205 tons; Centrals, 84 tons; Manicoba, 180 tons.

May 1, first latex, spot and nearby, were quoted 77 cents; July-December, 76 cents. Smoked sheet ribbed, spot and nearby, were 76½ cents; July-December, 75½ cents. Upriver fine, spot and nearby, were quoted 69 cents and May-June 70 cents. On May 29, First latex, spot and nearby, were quoted 67 cents, July-December 67 cents. Smoked sheet ribbed, spot and nearby, were quoted 66 cents, July-December 66 cents. Upriver fine, spot and nearby, were quoted 66 cents, and June-July 67 cents. There was a decline during this period of 10 cents in the spot plantation grades, 9 cents in the futures, while Para sorts were 3 cents less than four weeks ago. The fact that futures have recently been higher than spot rubber in New York, while the reverse is the case on the London market, is a strange anomaly.

LONDON.

The market was heavy early in the month due to the quantities of rubber in sight, and fair business was being done, principally by the exporters. Shipments to the United States had gone forward in much greater volume than last month, with the result that permits were withheld for a time. On May 1, Standard crepe, spot was quoted 3s. ¾d. [74.5 cents]. October-December was 3s. 1¼d. [75.5 cents]. Smoked sheets, spot, were 3s. ½d. [73.99 cents]. Hard fine sold at 2s. 10½d. [69.93 cents]. Values continued to fall during the month and on May 24, Standard crepe, spot, was selling at 2s. 9d. [66.89 cents]. July-December was quoted 2s. 9d. [67.91 cents]. Smoked sheets, spot, were 2s. 8d. [64.87 cents] and July-December sold for 2s. 9½d. [67.91 cents]. Standard crepe having declined, ¾d. [7½ cents] and Smoked sheet, 4½d. [8½ cents] during the first three weeks of May. The peculiar position of spot rubber selling from ½d. to 1d. [1 to 2 cents] below futures continues to be a surprising feature of the London market.

SINGAPORE.

The 5 auctions held between April 27 and May 23, inclusive, realized a total sale of 1,350 tons of all grades. First latex crepe

averaged 67.5 cents and Smoked sheet averaged 65.3 cents. The market has shown a steady decline of 13.2 cents a pound for First latex and 11.9 cents for Smoked sheet. On May 23 the difference between Singapore and New York spot prices was 7 cents for First latex and 7.8 cents for Smoked sheet rubber, with the demand active.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and May 29, the current date:

PARS.	June 1, 1915.	May 1, 1916.	May 29, 1916.
Upriver, fine, new.....	61 @	70 @ 67½	66 @
Upriver, fine, old.....	.....	.....	.....
Islands, fine, new.....	52 @	54 @ 51	60 @
Islands, fine, old.....	.....	.....	.....
Upriver, coarse, new.....	46 @	54 @ 55	49 @
Upriver, coarse, old.....	.....	.....	.....
Islands, coarse, new.....	28½ @	34½ @	30 @
Islands, coarse, old.....	.....	.....	.....
Camels, ball, new.....	32 @	38½ @	34½ @
Camels, ball, old.....	47 @	56 @	49 @
Camels, ball, new.....	44 @	54 @	45 @

PLANTATION.

First latex crepe, { Spot..... 60½ @	Spot..... 78½ @ 79	Spot..... 66½ @ 67½
{ About 60½ @	May-June 78½ @ 79	July-Dec. 66 @
Amber crepe, light	{ Spot..... 70½ @ 77	Spot..... 64 @ 65½
{ May-June	May-June	July-Dec. 64 @
Brown crepe, clean	{ Spot..... 75½ @ 76	Spot..... 62 @ 63½
{ May-June	May-June	July-Dec. 62 @ 63
Smoked sheet, ribbed	{ Spot..... 78 @ 78½	Spot..... 68 @ 69
{ About 61 @	May-June 78 @ 78½	July-Dec. 68 @ 69
Fine sheets and biscuits, unsmoked	Spot..... 78 @ @

CENTRALS.

Colombia	46 @	51 @	42 @ 43
Esmeralda, sausage	45 @	50 @ 50½	41 @ 42
Nicaragua, strap	50 @	50 @	40 @ 41
Mexican plantation, sheet .....	.....	64 @ 65	42 @ 43
Mexican, strap .....	.....	48 @ 49	39 @ 42
Mexican, s-l-b .....	.....	36 @ 37	36 @ 37
Manicoba .....	.....	47 @	44 @ 46½
Mangabeira, sheet	38 @	42 @	39 @
Guavule	29 @	38 @ 39	38 @ 39
Balata, sheet	55 @	67 @	70 @ 70½
Balata, block	45 @	54 @	.....

AFRICAN.

Lopori, ball, prime.....	53 @ 55	70 @	64 @
Lopori, strap, prime.....	.....	.....	.....
Upper Congo, ball, red.....	.....	68 @	62 @
Rio Nunez Niggers.....	54 @	67 @	63 @
Conakry Niggers.....	55 @	72 @	61 @ 62
Masai, red	54 @	68 @ 69	59 @
Soudan, Niggers .....	.....	.....	.....
Cameron, ball, soft.....	.....	.....	.....
Cameron, ball, hard.....	.....	.....	.....
Benguela, No. 1.....	30 @	48 @	44 @
Benguela, No. 2.....	.....	42 @ 44	30 @
Acra, flake	23 @	38 @	35 @

EAST INDIES.

Assam .....	.....	.....	44 @
Bontomat,	7½ @ 7½	10½ @	7½ @
Gutta Siak	17 @	25 @	25 @
Gutta red Niger	27 @	25 @	25 @
BORNEO III	30 @	.....	.....
Gutta Percha	1 50 @ 2.00	1 50 @ 2.50	.....

MARKET CABLE SERVICE FROM SINGAPORE.

The following reports of the weekly auctions held at Singapore have been called by the Waterhouse Co., Limited:

Date.	Crépe.	Smoked Sheet, Pounds.	Market.
April 27.....	Price per lb. 75.6	Sold.....	616,000 Weak.
May 4	68.4	68.8	378,560 Weaker—less demand.
May 10	67.5	63.3	403,200 Steady—demand moderate.
May 17	63.7	61.2	616,000 Quiet—Slightly weaker.
May 23	62.4	60.7	672,000 Active—good demand.

IMPORTS AND EXPORTS OF RUBBER AND GUTTA AT SINGAPORE.

IMPORTS.

February, 1916.

March, 1916

From	Para Rubber for Treatment.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.	Para Rubber for Treatment.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.
Federated Malay States—								
Port Swettenham..... pounds	831,196	.....	.....	.....	1,817,723	416,800	.....	.....
Tekong Anson.....	547,006	.....	.....	.....	940,600	6,533	.....	.....
Muar.....	412,133	9,066	.....	.....	679,200	53,866	.....	.....
Kelantan.....	72,666	.....	.....	.....	88,833	.....	.....	.....
Poreh (Johore).....	64,133	50,266	.....	.....	88,766	133,600	.....	.....
Kuantan.....	32,766	.....	.....	.....	38,000	.....	266	.....
Mersing.....	11,733	.....	.....	.....	7,700	4,266	.....	.....
Bekohat.....	3,600	.....	.....	.....	11,966	.....	.....	.....
Pahang.....	1,600	.....	.....	.....	400	.....	.....	.....
Tringgann.....	133	.....	.....	.....	.....	.....	.....	.....
Totals.....	1,976,536	59,332	.....	.....	3,671,898	615,065	266	.....
Sumatra—								
Tanahmassam.....	48,400	13,333	48,000	89,600	173,333	26,266	26,666	55,933
Indragiri.....	13,471	27,966	.....	4,666	4,666	21,866	.....	40,000
Pasir.....	7,466	.....	133	4,000	13,733	.....	400	.....
Sek.....	5,600	.....	.....	.....	6,000	.....	.....	.....
Palaohang.....	3,466	.....	.....	.....	3,466	.....	.....	767,600
Sedih.....	3,066	.....	.....	.....	3,200	.....	.....	.....
Bilawan.....	160,933	.....	.....	.....	8,133	129,866	.....	.....
Bengkelen.....	.....	.....	.....	.....	1,333	.....	.....	.....
Muntel.....	.....	.....	.....	.....	533	.....	.....	.....
Bengkalis.....	.....	3,333	.....	7,733	.....	.....	7,463	13,333
Port Bon.....	.....	3,466	.....	.....	.....	.....	.....	.....
Totals.....	81,468	202,132	31,466	98,266	512,398	64,500	212,264	60,396
Borneo—								
Sarawak.....	56,400	40,266	.....	31,066	676,533	42,133	35,600	580,933
Pontianak.....	25,333	1,733	4,800	4,266	16,533	81,333	4,934	15,066
Sido.....	13,600	.....	533	9,200	31,866	.....	1,333	272,933
Sungai.....	10,666	5,133	.....	4,266	23,466	.....	9,333	88,400
Sungaiwang.....	800	.....	.....	.....	5,066	.....	.....	.....
Samatinda.....	.....	18,533	8,600	.....	1,866	.....	8,533	1,600
Samput.....	.....	6,666	173,333	.....	.....	.....	.....	.....
Totals.....	106,799	41,999	23,866	55,333	963,065	185,730	40,534	14,932
British North Borneo—								
Lahad.....	13,733	.....	.....	5,733	72,933	21,333	8,800	137,600
Revolon.....	74,000	.....	.....	6,933	83,200	39,600	235,866	.....
Sarimbang.....	2,133	49,533	.....	.....	18,666	34,000	800	.....
Kudat.....	14,266	.....	.....	.....	9,866	23,200	.....	.....
Totals.....	25,732	93,199	.....	12,666	108,133	89,465	301,866	933
Straits Settlements—								
Penang.....	786,766	85,600	.....	.....	939,066	2,800	.....	.....
Malacca.....	351,866	448,866	.....	.....	531,866	575,863	.....	.....
S. Fandana.....	4,766	.....	.....	.....	.....	.....	.....	.....
Totals.....	1,142,398	531,466	.....	.....	1,475,732	578,663	.....	.....
Java—								
Baravia.....	125,800	.....	.....	86,533	.....	.....	.....	.....
Bel.....	73,800	318,933	.....	88,666	286,133	.....	.....	.....
Sourabaya.....	8,800	.....	.....	99,733	.....	.....	.....	.....
Totals.....	205,466	318,933	.....	.....	274,932	286,133	.....	.....
Burma—								
Alor.....	49,733	.....	.....	.....	.....	6,000	.....	.....
Kin.....	4,133	.....	.....	.....	.....	8,800	.....	.....
Total.....	53,866	.....	.....	.....	.....	14,800	.....	.....
Siam—								
Bangkok.....	.....	.....	8,266	.....	.....	400	7,733	.....
Port.....	.....	.....	.....	.....	.....	1,200	266	.....
Totals.....	.....	.....	8,266	.....	.....	1,600	7,999	.....
Natives and Arabians Islands—								
.....	93,733	.....	.....	.....	.....	266	.....	.....
.....	164,833	.....	.....	.....	186,000	933	2,600	23,300
Other ports.....	236,666	184,266	4,800	19,600	244,800	110,800	546	192,533
Grand Totals.....	4,023,187	1,431,327	80,133	1,626,996	6,209,723	2,145,323	23,595	111,992

EXPORTS.

February, 1916.

March, 1916

To	Para Rubber Transhipped.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.	Para Rubber Transhipped.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.
United Kingdom—								
London..... pounds	74,736	.....	.....	.....	1,049,736	33,466	13,600	109,733
Liverpool.....	294,800	.....	20,666	67,733	.....	.....	.....	.....
S. Fandana.....	.....	.....	.....	.....	.....	.....	.....	.....
France (Marseilles).....	.....	11,200	.....	10,400	49,333	.....	21,333	8,133
Russia (Vladivostok).....	732,666	.....	.....	.....	1,759,466	.....	.....	35,333
Port (Vladivostok).....	.....	.....	.....	.....	100,933	.....	.....	.....
Totals.....	1,697,732	1,212,500	11,200	306,932	79,133	2,692,934	1,383,066	186,933
United States—								
San Francisco.....	1,127,533	32,300	18,000	227,333	589,733	2,499,866	975,466	817,200
Seattle.....	15,733	.....	.....	.....	39,466	938,666	47,166	2,488,000
San Francisco.....	246,933	.....	.....	.....	2,112,566	41,866	.....	27,333
San Francisco.....	.....	.....	.....	.....	.....	.....	.....	199,333
Canada—								
Montreal.....	.....	.....	.....	.....	31,200	.....	.....	.....
Montreal.....	.....	.....	.....	.....	94,000	.....	.....	.....
Totals.....	1,450,200	645,732	18,000	272,133	784,799	5,680,931	1,073,431	175,866
Grand Totals.....	1,858,232	29,200	579,065	862,932	8,673,865	2,456,497	32,533	3,675,332

CRUDE RUBBER ARRIVALS AT THE PORT OF NEW YORK.

Weights in Pounds.

APRIL 22—By the steamer *Boniface* from Pará and Manaós:

	Em.	Alum.	Coarse.	Caucho.	Total.
Meyer & Brown	7,400	49,400	163,000		241,900
General Rubber Co.	400,000	44,000	140,700	122,000	706,600
Amick & Zeiss	20,000	7,400	131,800	150,000	392,600
Henson & Korth	40,000	14,000	141,400	22,300	238,500
H. A. Astlett & Co.				74,200	135,300
Paul Bartsch		1,300	15,600	41,600	64,100
H. A. Astlett & Co.		25,900	38,400	4,100	78,400
Paul & Dumont		3,000	18,900	33,500	71,500
Hagemeyer & Beyer					56,000
G. Amisack & Co.		1,100	16,500	26,500	54,000
J. T. Johnstone & Co.		2,100	6,800	16,100	34,600
Ross Products Co.			10,400	11,100	21,500
Valenzuela & Hirsch			4,000		8,500
Roesbros. & Sons					8,500
Totals	500,000	111,400	574,100	665,100	2,124,500

MAY 2—By the steamer *Stephen* from Pará:

	Em.	Alum.	Coarse.	Caucho.	Total.
Meyer & Brown	7,400	49,400	163,000		241,900
Amick & Zeiss	20,000	7,400	131,800	150,000	392,600
General Rubber Co.	400,000	44,000	140,700	122,000	706,600
H. A. Astlett & Co.				74,200	135,300
J. T. Johnstone & Co.		2,100	6,800	16,100	34,600
Henson & Korth	40,000	14,000	141,400	22,300	238,500
Paul Bartsch		1,300	15,600	41,600	64,100
Paul & Dumont		3,000	18,900	33,500	71,500
Ross Products Co.			10,400	11,100	21,500
W. R. Grace & Co.			1,300		1,100
Totals	500,000	111,400	574,100	665,100	2,124,500

MAY 3—By the steamer *Sao Paulo* from Pará:

	Em.	Alum.	Coarse.	Caucho.	Total.
Meyer & Brown	7,400	49,400	163,000		241,900
Amick & Zeiss	20,000	7,400	131,800	150,000	392,600
General Rubber Co.	400,000	44,000	140,700	122,000	706,600
H. A. Astlett & Co.				74,200	135,300
J. T. Johnstone & Co.		2,100	6,800	16,100	34,600
Henson & Korth	40,000	14,000	141,400	22,300	238,500
Paul Bartsch		1,300	15,600	41,600	64,100
Paul & Dumont		3,000	18,900	33,500	71,500
Ross Products Co.			10,400	11,100	21,500
W. R. Grace & Co.			1,300		1,100
Totals	500,000	111,400	574,100	665,100	2,124,500

PARAS.

	POUNDS.	Isaac Brandon & Bros.	Various
APRIL 27—By the <i>Christian Bora</i> =Montevideo:			
Muller, Schall & Co. (Fine).....	60,000		
Muller, Schall & Co. (Coarse).....	2,000		
MAY 8—By the <i>Dona</i> =Maranhão:			
G. Amisack & Co. (Caucho).....	35,000		
Roesbros. & Sons. (Caucho).....	1,000		
MAY 11. By the <i>Tanama</i> =Colon:			
W. R. Grace & Co. (Fine).....	9,000		
MAY 18—By the <i>Araca</i> =Colon:			
W. R. Grace & Co. (Fine).....	6,000		
W. R. Grace & Co. (Coarse).....	2,200		
G. Amisack & Co. (Fine).....	20,000		
G. Amisack & Co. (Coarse).....	3,200		
Muller, Schall & Co. (Caucho).....	7,200		
Neuss, Hesselin & Co. (Caucho).....	6,600		

CENTRALS.

*This sign, in connection with imports of Central, denotes Guayule rubber.]

APRIL 24 By the *Berthel*=Mexico:

G. Amisack & Co. 2,000

Graham, Hinkley & Co. 1,000 3,000

APRIL 24—By the *Calamarez*=Port Limer:

Isaac Brandon & Bros. 2,000

APRIL 27—By the *Colon*=Colon:

G. Amisack & Co. 10,100

J. S. Sembrada & Co. 5,200

Camacho Roldan & Van Sichel. 2,400

Mecke & Co. 3,200

Pablo Calvet & Co. 3,000

Lauman & Korth. 3,300

R. M. Capen's Sons. 6,500

G. B. Barthold. 1,400

De Solo Bros. & Pardo. 1,300

Muller, Schall & Co. 1,400

Lawrence Johnson & Co. 2,200

American Trading Co. 800

Piza Nephews & Co. 3,800

Rottberg, Ebeling & Co. 1,800

Fidauque Bros. & Co. 500

	Em.	Alum.	Coarse.	Caucho.	Total.
Neuss, Hesselin & Co.	7,400	49,400	163,000		241,900
Totals	264,100	37,600	175,100	254,500	731,300

MAY 8—By the steamer *Denis* from Iquitos:

Meyer & Brown	7,400	49,400	163,000		241,900
General Rubber Co.	400,000	44,000	140,700	122,000	706,600
H. A. Astlett & Co.				74,200	135,300
G. Amisack & Co.	19,100	1,800	7,900	82,700	111,500
H. C. Kupper	24,300		5,400	46,300	85,900
H. A. Astlett & Co.	18,900		5,500	13,000	37,400
W. R. Grace & Co.	3,700	1,100	1,600		8,400
J. T. Johnstone & Co.	1,800		800		2,600
Toledano Exporting Co.	300			1,200	1,500
Totals	71,000	3,000	34,600	184,000	312,600

MAY 8—By the steamer *Denis* from Pará and Manaós:

	Em.	Alum.	Coarse.	Caucho.	Total.
Meyer & Brown	7,400	49,400	163,000		241,900
General Rubber Co.	400,000	44,000	140,700	122,000	706,600
H. A. Astlett & Co.				74,200	135,300
Paul Bartsch		1,300	15,600	41,600	64,100
Amick & Zeiss	20,000	7,400	131,800	150,000	392,600
Henson & Korth	40,000	14,000	141,400	22,300	238,500
Aldens' Successors, Inc.					400
G. Amisack & Co.					400
E. D. Trigg Co.					400
Hagemeyer & Beyer					400
Totals	500,000	111,400	574,100	665,100	2,124,500

MAY 18—By the steamer *Atahualpa* from Pará and Manaós:

	Em.	Alum.	Coarse.	Caucho.	Total.
Meyer & Brown	7,400	49,400	163,000		241,900
Amick & Zeiss	20,000	7,400	131,800	150,000	392,600
General Rubber Co.	400,000	44,000	140,700	122,000	706,600
J. T. Johnstone & Co.		2,100	6,800	16,100	34,600
Henson & Korth	40,000	14,000	141,400	22,300	238,500
Paul Bartsch		1,300	15,600	41,600	64,100
Paul & Dumont		3,000	18,900	33,500	71,500
Aldens' Successors, Inc.					400
Amick & Zeiss					400
W. R. Grace & Co.					400
Totals	500,000	111,400	574,100	665,100	2,124,500

PUNES.

	POUNDS.	Isaac Brandon & Bros.	Various
APRIL 27—By the <i>Christian Bora</i> =Montevideo:			
Muller, Schall & Co. (Fine).....	60,000		
Muller, Schall & Co. (Coarse).....	2,000		
MAY 8—By the <i>Dona</i> =Maranhão:			
G. Amisack & Co. (Caucho).....	35,000		
Roesbros. & Sons. (Caucho).....	1,000		
MAY 11. By the <i>Tanama</i> =Colon:			
W. R. Grace & Co. (Fine).....	9,000		
MAY 18—By the <i>Araca</i> =Colon:			
W. R. Grace & Co. (Fine).....	6,000		
W. R. Grace & Co. (Coarse).....	2,200		
G. Amisack & Co. (Fine).....	20,000		
G. Amisack & Co. (Coarse).....	3,200		
Muller, Schall & Co. (Caucho).....	7,200		
Neuss, Hesselin & Co. (Caucho).....	6,600		

AFRICANS.

	POUNDS.	Isaac Brandon & Bros.	Various
APRIL 24 By the <i>Naima</i> =Lisbon:			
S. R. Sequeira	112,000		
APRIL 24—By the <i>Rochambeau</i> =Bordeaux:			
Rubber Trading Co.	23,320		
Michelin Tire Co.	22,500		
APRIL 26—By the <i>Idaho</i> =Hull:			
Robert Badenhop Co.	13,500		
APRIL 28 By the <i>Orduna</i> =Liverpool:			
Robert Badenhop Co.	53,000		
J. T. Johnstone & Co.	33,500		
General Rubber Co.	22,500		
APRIL 28—By the <i>Orduna</i> =Bordeaux:			
Rubber Trading Co.	17,000		
Various	25,000		
MAY 1—By the <i>Valeria</i> =Liverpool:			
Robert Badenhop Co.	11,200		
MAY 1—By the <i>Celtic</i> =Liverpool:			
Rubber Trading Co.	2,800		
MAY 8—By the <i>Hindoo</i> =Hull:			
J. T. Johnstone & Co.	21,900		

Rubber Estates of Johor, Ltd.	30,550	Pounds.
Anglo Malay Rubber Co.	56,030	
Penang Rubber Estate & Allied Cos.	11,440	796,510

TO BOSTON.

Hood Rubber Co.		
Penang Rubber Estate & Allied Cos.	6,440	

TO NEW YORK.

United States Rubber Co.	190,450
General Rubber Co.	
Henderson & Korn.	
Sirdang Central Plant, Ltd.	1,690
Lang Kat Sumatra Rubber Co.	1,690
Tamejing Rubber Estates.	1,690
Kandar Sumatra Rubber Co.	1,690
United Sirdang Rubber Plantations.	1,690
Rubber Trading Co.	
Anglo Sumatra Rubber Co.	1,430
Penang Rubber Estate & Allied Cos.	11,050
J. T. Johnstone Co.	
Anglo Sumatra Rubber Co.	2,860
Raw Product Co.	
Sealang Rubber Estate Co.	4,290
Arthur Meyer & Co.	
Anglo Sumatra Rubber Co.	2,860
Penang Rubber Estate & Allied Cos.	23,010
Arnold & Zeiss.	
Tandjong Rubber Co.	2,730
United Sirdang Rubber Plantations.	4,420
W. Mansfield & Co., Ltd.	4,160
Goodyear Tire & Rubber Co.	
United Sirdang Rubber Plantations.	3,250
L. Littlejohn & Co.	
United Sirdang Rubber Plantations.	7,800
Herbert Symons & Co.	
Weller & Co.	203,190
British Consul General.	
General Rubber Co.	496,340
Schneid, Schudel & Co.	24,440
Penang Rubber Estate & Allied Cos.	2,210
Charles T. Wilson & Co.	
Penang Rubber Estate & Allied Cos.	11,050
Robinson & Co., New York.	
G. H. Slet & Co.	8,450 1,012,440

TO SEATTLE.

The B. F. Goodrich Co.	
W. T. Easley.	351,650
Henderson & Korn.	
East Asiatic Co., Ltd.	34,060
Goodyear Tire & Rubber Co.	
C. Macbie & Co.	147,940
The Buket Cloh Rubber Co.	3,640
Banstead & Co.	4,160
W. H. Grace & Co., Ltd.	21,710
Mansfield & Co.	3,250
The Plantation Rubber Estates	4,550
H. B. Co., New York.	
Chetas Rubber Estates, Ltd.	2,470
W. R. Grace & Co.	
The Sengie Furcen Rubber Co.	2,470

Planters Stores & Agency Co.	9,100	Pounds.
The Penang Estate & Allied Cos.	11,050	
L. Littlejohn & Co.		
United Sirdang Rubber Plantations.	3,250	
Banstead & Co.	4,420	
The Penang Estate & Allied Cos.	30,680	
Grace Bros. for San Francisco.		
Sungai Regla Rubber Estate.	1,950	636,350
Not given.		
Geo. Stewart & Co.	35	pcks.
May 13.—By the steamer <i>Hawaii Maru</i> : Consignment—		

TO AKRON.

The B. F. Goodrich Co.	
W. T. Easley.	507,000
The Firestone Tire & Rubber Co.	
The Waterhouse Co.	172,510 679,510

TO NEW YORK.

Henderson & Korn.	
International Trade Co.	149,370
R. R. Grace & Co.	
H. S. Godwin.	38,350
Robert Badenhop Co., Inc.	
British Consul General, New York.	18,950 206,700

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK—FEBRUARY, 1916.

IMPORTS:	POUNDS.	VALUE.
India rubber	17,253,139	\$11,267,202
Balata	225,660	89,357
Gutta percha	107,134	12,055
Gutta jelutong (Pontianak).	1,108,055	59,380
Rubber scrap	514,792	43,229
Totals	19,209,780	\$11,471,203
EXPORTS:		
India rubber	289,219	\$147,550
Balata	147,910	\$1,109
Totals	437,129	\$198,768

PORT OF NEW YORK—MARCH, 1916.

IMPORTS:	POUNDS.	VALUE.
India rubber	23,859,096	\$15,743,731
Balata	265,240	107,034
Gutta percha	210,325	26,696
Gutta jelutong (Pontianak).	1,090,140	75,016
Rubber scrap	1,171,484	93,253
Totals	26,596,285	\$16,043,660
EXPORTS:		
India rubber	20,000	\$10,080
Balata	55,484	26,996
Totals	75,484	\$37,076

PORT OF BOSTON—MARCH, 1916.

EXPORTS:	POUNDS.	VALUE.
Rubber scrap	11,423	\$1,003
Manufactures of india rubber		101,518
Totals	11,423	\$102,521

PORT OF BOSTON—APRIL, 1916.

IMPORTS:	POUNDS.	VALUE.
India rubber	145,600	\$120,002
Gutta percha	22,421	1,941
Gutta jelutong (Pontianak).	237,220	9,404
Manufactures of india rubber		4,250
Totals	425,241	\$135,597

PORT OF CLEVELAND—APRIL, 1916.

IMPORTS:	POUNDS.	VALUE.
India rubber	690,608	\$486,112

PORT OF DETROIT—APRIL, 1916.

IMPORTS:	POUNDS.	VALUE.
Rubber scrap	380	\$11
EXPORTS:		
Rubber scrap	30,004	\$900
Reclaimed rubber	14,242	2,453
Totals	44,246	\$3,353

PORT OF HURON—APRIL, 1916.

EXPORTS:	POUNDS.	VALUE.
Rubber scrap	30,004	\$900
India rubber boots, (pairs)	1,740	4,180
Automobile tires		119
Other rubber tires		992
Belted hose, etc.		96
Other manufactures of india rubber		2,193
Totals	31,744	\$8,474

PORT OF NEW ORLEANS—APRIL, 1916.

IMPORTS:	POUNDS.	VALUE.
India rubber	79,199	\$34,224
EXPORTS:		
Automobile tires		\$1,185
Other rubber tires		106
Belted hose, etc.		1,357
All other manufactures of india rubber		804
Totals		\$4,352

PORT OF PHILADELPHIA—APRIL, 1916.

IMPORTS:	POUNDS.	VALUE.
Manufactures of india rubber.		\$448
EXPORT:		
Manufactures of india rubber.		\$7

PORT OF SAN FRANCISCO—APRIL, 1916.

IMPORTS:	POUNDS.	VALUE.
India rubber	692,495	\$561,370
Gutta percha		670
Manufactures of india rubber		270
Totals	692,495	\$562,310
EXPORTS:		
Reclaimed rubber	23,437	\$2,385
India rubber boots, (pairs)	165	898
India rubber shoes	9,475	5,764
Automobile tires		101,911
Other rubber tires		23,192
Belted hose, etc.		21,784
All other manufactures of india rubber		17,374
Totals	33,077	\$173,308

EXPORTS OF INDIA RUBBER FROM MANAOS DURING MARCH, 1916.

EXPORTERS	NEW YORK.					EUROPE.					Grand Totals.
	Fine.	Medium.	Coarse.	Caucho.	Totals.	Fine.	Medium.	Coarse.	Caucho.	Totals.	
Suter & Co.	121,804	11,094	47,498	62,490	242,886	83,658	9,917	2,098	58,250	153,923	396,809
General Rubber Co.	146,520	19,266	65,290	117,924	349,000	61,671	24,124	1,577	98,743	185,915	534,915
I. G. Araujo.	80,696	10,390	45,231	35,126	171,443	61,868	10,492	21,689	7,067	101,116	272,559
Pralow & Co.	34,987	2,499	4,489		41,975	138,130	7,620	5,155	72,645	223,550	265,525
Tancredi Porto & Co.	38,566	21,890	32,110	38,917	131,483	42,988	24,312	10,075	30,366	107,741	239,224
Armazens Andresen	36,436	5,026	11,990	32,912	86,364						86,364
Mendes & Co.	20,320		400	100	20,820	12,819	7,520	1,583	5,146	27,068	47,888
Adelbert H. Alden, Limited.		3,291	4,447		7,738	16,744			20,451	37,195	44,933
Stomach & Co.						12,603	974	483	11,753	25,813	25,813
Gaspar Almeida & Co.	4,751	524	3,695	12,631	21,601						21,601
Semper & Co.	7,676	833	9,362	1,824	19,685						19,685
Ferra d'Oliveira & Sobro.				17,968	17,968						17,968
Sinfonino & Co.	8,778	1,201	3,277	335	13,591						13,591
Amorim Irmaos					7,060	800	2,760	1,650	1,280	12,880	12,880
Gomes & Co.					3,884			4,705	8,593	8,593	8,593
Totals	500,534	76,004	227,788	330,217	1,134,543	442,045	85,759	45,200	310,780	883,804	2,008,358
Sundries	1,789	232	791	285	3,097	8,275	1,271	3,813	7,598	21,226	24,293
Totals: March, 1916	502,323	76,236	228,580	330,482	1,127,621	450,320	87,029	49,033	318,648	905,030	2,032,651
February, 1916	546,003	82,739	191,537	205,419	1,025,698	164,400	27,810	56,344	119,239	367,792	1,393,490
January, 1916	561,143	110,411	176,779	148,142	996,475	543,822	58,574	75,105	123,703	801,204	1,797,679

(C. M. P. H. S. Suter & Co., Manaus.)

IMPORTS AND EXPORTS OF CRUDE AND MANUFACTURED RUBBER AT THE PORT OF NEW YORK.

	India Rubber		Scrap for Re-manufacture.		Balata.		Gutta Ichting.		Gutta Percha.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Week Ending										
April 21, 1916.	5,169,015	\$3,442,588	125,317	\$14,663	44,717	\$5,200	10,6919	\$45,959	7,000	\$5,924
April 28, 1916.	6,234,156	4,014,738	115,409	8,246	30,681	3,876	261,536	16,099	76,410	6,793
May 5, 1916.	6,659,563	4,188,167	138,791	9,554	17,119	6,561	268,797	19,635	48,620	19,846
May 12, 1916.	6,836,564	2,287,292	150,363	6,841	33,515	17,303				

EXPORTS.

FIGURES ISSUED FROM APRIL 25, 1916, TO MAY 23, 1916.

EXPORTED TO	Belting, Hose and Packings	Footwear		Tires		Insulated Wire and Cables	Other mfr of India Rubber	Mountain Tents	Chewing Gum	Reclaimed Rubber	Scrap Rubber
		Boots	Shoes	Auto	Other						
EUROPE											
Denmark						\$18,094	\$13,978	\$5,674		\$170	
France	\$1,376		\$8,931					1		3,000	\$5,406
Germany		43		\$1,431	\$5,803		8,370	\$1,748			
Italy		10	\$15	131	801		16	683			
Netherlands					960		430	204			
Norway		1,000			960	475	900	180			
Portugal		16			20,150		516	30	16		
Russia in Europe					62	15,480		516	30		
Spain					60		1,308	280			
Sweden							156				
United Kingdom											
England	\$1,136	967	\$5,244	\$1,612	1,6887	\$6,696	235,135	7,681	6,300	\$6,063	\$886
Scotland			2,067	2,866			2,125				\$6,887
Totals, Europe	\$1,455	\$18	\$46,173	\$27,395	\$26,750	\$10,880	\$187,131	\$4,761	\$9,470	\$28,663	\$21,179
NORTH AMERICA											
Bermuda	880		43				\$13	\$8	\$68		
British Honduras											
Canada							\$226				
Central American States											
Costa Rica	88			\$355		1,167		147	100		
Guatemala	944										
Honduras				158							
Nicaragua	60					13	216	6			
Panama	1,150			765		29,346	740		200		
Salvador	604			26			1,130		578		
Mexico	11,466		77	7,616	1,475	2,875	4,113	48			
Newfoundland	71	\$5,768	1,270	176		580	912	14	87		
West Indies											
British											
Barbados			55	456			183				
Jamaica	227			4,177	47	88	116				
Trinidad and Tobago	179			1,243			745	535			
Other British	1,311			1,831	76		260				
Cuba	9,666		771	42,086	28,103	28,560	4,812	400	760		
Danish	69			108	16	50	17		1		
Dutch	10		4	489		7		550	6		
French				322	14		51	32			
Italian	136			76			78	234			
Santo Domingo	203	48	135	2,490	645		112	16	40		
Totals, North America	\$7,763	\$2816	\$3,999	\$68,557	\$33,887	\$73,186	\$38,310	\$2,005	\$2,103		
SOUTH AMERICA											
Argentina	\$8,869		\$394	\$36,163	\$3,237	\$4,103	\$24,425	\$547	\$317	\$1,000	
Bolivia	54			10,104		73					
Brazil	4,676		860	9,827	5,576	10,348	17,273	1,514			
Chile	1,491		3,794	7,136	118	22,442	1,477				
Colombia	1,015		21	3,008	595	2,023	2,553	23			
Ecuador	1,047			237		879	661				
Guiana British	1,925			124			50				
Dutch							226				
French			68	1,150	339	1,212	584		27		
Peru	2,169	\$2,135		3,284	11,164	5,514	2,335				
Uruguay	906			3,569	441	867	2,397				
Venezuela	446										
Totals, South America	\$22,698	\$2,335	\$8,361	\$81,781	\$10,516	\$46,249	\$51,981	\$2,084	\$344	\$1,200	
ASIA											
China	\$1		\$1			\$2,832	\$574		\$20		
British East Indies—											
British India	600	\$481		16,649	\$8,812	14,273	3,514	848			
Dutch East Indies	4,683		136	464		4,096	4,738	748			
Hongkong	150			55			55				
Japan	173			716		1,128	566				
Totals, Asia	\$8,857	\$481	\$846	\$19,468	\$8,832	\$22,317	\$8,861	\$696	\$20		
OCEANIA											
British—											
Australia and Tasmania	\$1,009		\$6,677	\$5,081	\$1,253	\$10,631	\$13,067		\$1,816		
New Zealand	781	\$95	535	6,573			357		30		
Philippine Islands	3,857			2,984	4,677	1,441	7,440	\$335			
Totals, Oceania	\$6,264	\$95	\$7,212	\$14,610	\$6,004	\$12,409	\$13,864	\$335	\$1,836		
AFRICA											
British Africa—											
South	\$1,074	\$714	\$699	\$26,606	\$206	\$5,291	\$6,007		\$222		
Egypt							76				
Totals, Africa	\$20,724	\$714	\$699	\$26,606	\$206	\$5,291	\$6,083		\$222		

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—(value)	February, 1916.		Eight Months Ending February, 1916.	
	Pounds.	Value.	Pounds.	Value.
India rubber:				
From:				
France	146,451	\$85,651	303,315	\$160,874
Portugal	129,337	78,090	1,990,107	752,937
United Kingdom	5,637,364	4,590,909	47,823,798	29,551,401
Central America and British Honduras	115,552	55,444	793,037	355,603
Mexico	705,382	331,196	1,995,590	780,764
Hawaii	5,494,583	3,234,746	34,304,930	14,914,826
Other South America	768,530	303,102	4,457,859	1,997,405
East Indies	8,793,402	4,806,369	67,278,057	35,925,696
Other countries	208,175	181,205	614,226	427,481
Totals	21,771,355	\$13,698,159	159,560,919	\$84,866,987

Balata	226,660	\$99,337	1,781,831	\$862,244
Guayule gum	199,189	68,972	1,803,978	597,465
Gutta jelutong	1,423,635	73,592	16,453,995	718,137
Gutta percha	186,000	19,406	1,606,914	174,105

Totals	23,806,859	\$13,949,866	181,207,637	\$87,033,958
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Rubber scrap	1,425,322	\$125,029	10,938,869	\$838,306
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Totals, unmanufactured	25,232,181	\$14,074,895	192,146,506	\$87,877,264
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Chicle (not datable)	757,002	\$297,840	4,726,769	\$1,717,682
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MANUFACTURED—(value)				
Gutta percha		\$1,150		\$6,931
India rubber		29,495		202,151

Totals, manufactured		\$30,645		\$209,082
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Substitutes—elasticon, etc.		\$2,022		\$13,385
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EXPORTS OF DOMESTIC MERCHANDISE.

MANUFACTURED—	February, 1916.		Eight Months Ending February, 1916.	
	Pounds.	Value.	Pounds.	Value.
Automobile tires:				
To Russia in Europe		\$620,350		\$1,086,070
England		29,385		\$,857,732
Canada		145,416		86,310
Mexico		41,340		170,319
Cuba		40,713		309,351
India		149,736		946,624
New Zealand		158,661		565,458
Philippine Islands		\$3,716		221,296
Other countries		385,684		1,705,095
Totals		\$1,987,901		\$11,744,255

All other tires		\$230,862		\$2,015,470
Belt, hose and packing		308,122		1,773,633
Rubber boots		110,446		1,355,540
Rubber shoes (pairs)		79,464		1,277,931
Scrap and old rubber		366,133		2,635,918
Reclaimed rubber		419,404		4,317,606
Other rubber manufacture		639,322		4,057,258
Totals, manufactured		\$3,474,126		\$22,490,993

Fountain pens (number)	23,219	\$12,034	109,704	\$98,297
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EXPORTS OF FOREIGN MERCHANDISE.

UNMANUFACTURED—	February, 1916.		Eight Months Ending February, 1916.	
	Pounds.	Value.	Pounds.	Value.
Balata	147,900	\$31,199	343,987	\$129,535
Guayule gum		18,500		7,279
Gutta jelutong		2,773		305
Gutta percha		5,025		59,890
India	763,279	440,887	3,238,736	1,174,279
Rubber scrap and refuse		9,204		734
Totals, unmanufactured	913,617	\$499,611	3,673,090	\$1,944,049

Chicle	10,100	\$3,445	109,006	\$31,786
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MANUFACTURED—				
Gutta percha		\$55		\$240
India rubber		29,518		37,113

Totals, manufactured		\$29,573		\$37,353
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EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

	February, 1916.		Eight Months Ending February, 1916.	
	Pounds.	Value.	Pounds.	Value.
To Alaska:				
Belt, hose and packing		\$3,688		\$75,081
Automobile tires (pairs)	2,056	4,526	41,996	106,579
Other rubber goods		1,919		21,377
Totals		\$10,133		\$203,037

To Hawaii:				
Belt, hose and packing		\$4,844		\$58,613
Automobile tires		38,973		350,164
Other tires		13,337		44,670
Other rubber goods		7,989		59,335
Totals		\$65,142		\$492,782

I-Philippine Islands:

Tires	\$1,713		\$15,801
Tires in sheets		16,706	14,660
Boots	70,360		260,109
Other rubber goods	15,828		1,21,800
Totals	\$98,951		\$432,406

To Porto Rico:

Belt, hose and packing	\$1,884		\$27,626
Automobile tires	36,652		250,441
Other tires	11,242		24,937
Other rubber goods	4,821		43,366
Totals	\$54,599		\$346,370

RUBBER STATISTICS FOR CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—(value)	February, 1916.		Eleven Months Ending February, 1916.	
	Pounds.	Value.	Pounds.	Value.
Rubber and gutta percha, crude caoutchouc or india rubber:				
From Great Britain	399,633	\$354,357	4,445,894	\$2,577,995
United States	479,402	3,811	4,097,726	2,257,959
Straits Settlements			22,574	11,659
Other countries			232,045	106,318
Totals	879,035	\$668,168	8,798,239	\$4,917,190

Rubber, re-covered:				
From Great Britain			4,392	\$2,482
United States	398,878	\$53,358	4,324,783	558,042
Totals	398,878	\$53,358	4,329,175	\$560,524

Hard rubber, in sheets and rods:				
From Great Britain			2,302	\$1,404
United States	3,687	\$1,909	158,633	19,640
Totals	3,687	\$1,909	160,935	\$21,044

Rubber substitutes:				
From Great Britain			16,644	\$1,812
United States	21,601	\$1,624	473,271	36,818
Totals	21,601	\$1,624	489,915	\$38,630

Rubber, powdered, and rubber or gutta percha waste:				
From Great Britain			7,314	\$579
United States	81,351	\$9,942	1,088,733	70,846
Other countries	80	4	15,594	644
Totals	81,431	\$9,946	1,111,641	\$72,059

Rubber thread, not covered:				
From United States	6,015	\$8,124	31,754	\$43,424

Balata, crude:				
From United States			1,644	\$991

Chicle, crude:				
From Great Britain			2,888	\$1,675
United States	12,310	\$5,279	259,661	98,690
Honduras	168,379	63,267	1,133,905	420,885
Mexico			305,929	113,293
Totals	185,889	\$69,046	1,702,383	\$633,473

Totals	185,889	\$69,046	1,702,383	\$633,473
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MANUFACTURED—(value)	February, 1916.		Eleven Months Ending February, 1916.	
	General Tariff Value.	Preferential Tariff Value.	General Tariff Value.	Preferential Tariff Value.

Waterproof clothing:				
From Great Britain			\$18,932	\$3,454
United States	\$19,188		109,140	
Other countries			63	
Totals	\$19,188	\$18,932	\$112,657	\$30,906

Hose, lined with rubber:				
From Great Britain			\$16	\$545
United States	\$10,352		\$71,488	
Totals	\$10,352	\$16	\$71,488	\$545

Mats and matting				
From Great Britain				\$121
United States	\$316		\$2,523	
Totals	\$316		\$2,523	\$121

Packing				
From Great Britain			\$10	\$201
United States	\$7,301		48,828	
Totals	\$7,301	\$10	\$49,029	\$209

Tires of rubber for all vehicles:				
From Great Britain			\$1,145	\$14,102
United States	\$164,314		1,387,476	\$24,027
France			16,437	
Other countries			1,817	
Totals	\$164,314	\$1,145	\$1,395,832	\$24,027

*Rubber cement and all manufactures of rubber and gutta percha, N. O. P.:

From Great Britain	\$5	\$26,386	\$1,241	\$159,339
United States	49,494	.....	\$4,064	.....
Other countries	276	.....	1,064	.....
Totals	\$50,880	\$26,386	\$54,126	\$159,339
Hard rubber, in tubes:				
From United States	\$1,180	.....	\$4,376	.....
Boots and shoes:				
From Great Britain .....	.....	\$12	.....	\$11,558
United States	\$7,658	.....	\$80,866	.....
Other countries .....	.....	.....	10	.....
Totals	\$7,658	\$12	\$80,876	\$11,558
Belted:				
From Great Britain .....	.....	.....	.....	\$1,172
United States	\$4,710	.....	\$47,622	.....
Totals	\$4,710	.....	\$47,622	\$1,172
Welded, one inch wide:				
From Great Britain .....	.....	\$742	.....	\$78
United States	\$3,010	.....	158,319	.....
Other countries .....	.....	.....	380	.....
Totals	\$3,010	\$742	\$158,737	\$12,247

*In addition the imports of rubber cement and all manufactures of rubber and gutta percha not otherwise provided for amounted to \$60 from various countries for February; and \$207 from Great Britain and \$2,106 from various countries for the eleven months ending February, 1916, the values being at retail rates.

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	February, 1916.	Eleven Months Ending February, 1916.	
	Prod- uce of Canada Value.	Re-exports of foreign goods. Value.	Prod- uce of Canada Value.
Belted:			
To Great Britain .....	.....	\$150	.....
United States .....	.....	44	\$58
Newfoundland .....	.....	1,600	.....
Other countries .....	.....	35	.....
Totals .....	.....	\$1,667	\$58
Hose:			
To Great Britain	\$8,974	\$23,599	.....
United States .....	.....	3,976	\$201
Newfoundland .....	.....	3,233	.....
Other countries	\$2,214	16,518	.....
Totals	\$14,188	\$47,326	\$201
Boots and shoes:			
To Great Britain	\$157,359	\$237,648	.....
United States	102	3,633	\$58
Newfoundland	10,110	82,712	.....
Australia	4,072	30,796	.....
Other countries	11,260	34,433	327
Totals	\$182,793	\$36	\$889,224
Mats and matting:			
To Great Britain	\$1,263	\$2,547	.....
Other countries	5	469	.....
Totals	\$1,268	\$3,016	.....
Clothing:			
To Great Britain .....	.....	\$27	\$10
United States .....	.....	86	.....
Newfoundland .....	.....	140	.....
Other countries	\$120	182	.....
Totals	\$120	\$6	\$388
*Rubber waste:			
To Great Britain .....	.....	\$6,368	.....
United States	\$57,041	\$52,130	\$1,064
Totals	\$57,041	\$58,498	\$1,064
All other mfr., N. O. P.:			
To Great Britain .....	.....	\$251	\$945,841
United States .....	.....	3,932	103,282
Newfoundland .....	.....	34	4,975
Australia .....	.....	2,572	.....
Other countries .....	.....	116,739	10
Totals	\$118,210	\$4,183	\$1,074,744

*During February, 667,400 pounds of rubber waste was exported to the United States, making a total of \$142,500 pounds for the eleven months ending February, 1916. For the eleven months ending February, 1916, 660,600 pounds was exported to Great Britain.			
*During February, 287,111 pounds of gum chicle was exported to the United States. During the eleven months ending February, 1916, 20,000 pounds was exported to Great Britain, 1,456,874 pounds to the United States, and 1,042,000 pounds to various countries.			
{Gum chicle:			
To Great Britain .....	.....	\$10,000	.....
United States .....	.....	808,470	\$112,840
Other countries .....	.....	42,216	1,107
Totals	\$168,219	\$860,686	\$113,947

*During February, 667,400 pounds of rubber waste was exported to the United States, making a total of \$142,500 pounds for the eleven months ending February, 1916. For the eleven months ending February, 1916, 660,600 pounds was exported to Great Britain.

*During February, 287,111 pounds of gum chicle was exported to the United States. During the eleven months ending February, 1916, 20,000 pounds was exported to Great Britain, 1,456,874 pounds to the United States, and 1,042,000 pounds to various countries.

UNITED KINGDOM RUBBER STATISTICS FOR MONTH ENDING APRIL 30, 1916.

	IMPORTS.		Four Months Ending April, 1916.	
	Pounds.	Value.	Pounds.	Value.
Crude rubber:				
From Dutch East Indies	725,000	\$503,899	2,215,400	\$1,637,666
French West Africa	227,300	120,309	861,200	445,822
Gold Coast	320,000	156,477	652,200	278,021
Mexico	766,000	412,837	2,304,500	1,668,962
India	13,600	8,850	601,400	426,533
United States	3,479,500	2,322,001	10,174,000	7,122,157
British India	662,700	509,391	1,708,000	1,316,632
State Settlements and				
one, Labuan,	6,278,500	4,744,137	20,792,100	15,866,252
Federated Malay				
States	3,003,000	2,327,250	9,459,300	7,044,779
Other countries	1,711,900	97,255	7,088,700	6,36,672
Totals	17,026,400	\$12,251,620	\$8,379,600	\$42,611,271
Waste and reclaimed rubber:				
Gutta percha	438,500	247,957	1,025,200	1,344,339
Manufactures:				
Apparel, waterproofed .....	.....	8,720	.....	\$32,239
Insulated wire .....	.....	1,200	.....	399,009
Submarine cables .....	.....	21,282	.....	167,461
Automobile tires and tubes .....	.....	1,516,838	.....	30,292
Motorcycle tires and tubes .....	.....	6,216	.....	5,245,995
Cycle tires and tubes .....	.....	41,093	.....	152,735
Tires not specified .....	.....	5,822	.....	20,577

	EXPORTS.		Four Months Ending April, 1916.	
	Pounds.	Value.	Pounds.	Value.
Crude rubber:				
To France	\$31,288	.....	\$123,156
British East Africa	30,540	.....	67,422
British East Indies	21,321	.....	98,695
Australia	13,044	.....	96,611
New Zealand	7,844	.....	75,848
Canada	22,550	.....	67,470
Other countries	58,918	.....	279,056
Totals	\$185,505	.....	\$747,952
Boots and shoes, (Asian pairs)	7,889	\$38,038	29,609	\$150,053
Insulated wire	148,740	.....	690,732
Submarine cables	83,317	.....	417,053
Automobile tires and tubes	250,543	.....	1,379,739
Motorcycle tires and tubes	7,818	.....	6,470
Cycle tires and tubes	197,894	.....	910,185
Tires not specified	67,831	.....	270,109
Manufactures not specified	503,020	.....	2,182,583

EXPORTS—FOREIGN AND COLONIAL.

	April, 1916.		Four Months Ending April, 1916.	
	Pounds.	Value.	Pounds.	Value.
Crude rubber:				
To Russia	1,649,700	\$1,388,721	4,579,600	\$3,324,475
France	1,469,900	1,207,739	6,575,500	\$5,186,094
United States	3,962,200	3,212,611	19,042,000	14,442,842
Other countries	1,658,200	1,193,208	6,487,000	4,375,904
Totals	8,740,000	\$7,002,279	36,693,100	\$27,529,315
Waste and reclaimed rubber:	37,700	\$24,900	197,400	\$32,824
Gutta percha	80,300	13,229	199,400	47,711
Manufactures:				
Apparel, waterproofed .....	.....	830	.....	\$603
Insulated wire .....	.....	1,000	10,853	62,963
Automobile tires and tubes .....	.....	1,881	.....	27,751
Motorcycle tires and tubes .....	.....	186,225	.....	1,202,407
Cycle tires and tubes .....	.....	4,461	.....	12,124
Tires not specified .....	.....	7,330	.....	65,547
Manufactures not specified .....	.....	588	.....	3,528

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	Twelve Months Ending December 31, 1914.		Twelve Months Ending December 31, 1915.	
	Pounds.	Value.	Pounds.	Value.
India rubber and gutta percha				
From Straits Settlements	851,160	.....	2,767,600	.....
African Fr. Colony	64,240	.....	321,200	.....
Belgian Congo	179,740	.....	5,580,000	.....
Brazil	5,033,160	.....	7,504,600	.....
Other countries	588,500	.....	809,100	.....
Totals	6,716,800	\$4,125,044	11,808,000	\$7,251,222
Rubber scrap	1,670,440	\$114,862	3,664,100	\$225,009

MANUFACTURED—				
India rubber and gutta percha—				
—sheets—				
From Great Britain	26,800	54,780		
United States	33,149	48,400		
Other countries	14,080	3,520		
Totals	74,029	\$104,220	106,700	\$108,480
India rubber and gutta percha—				
—sheets—				
Cut sheets	3,680	\$4,680	4,620	\$6,120
Elastic fabric	11,200	3,415	4,620	1,418
Insulated wire	430	273	440	104
Hard rubber	17,820	10,743	40,480	24,858
India rubber and gutta percha—				
—fabrics—				
Cut sheets	7,480	\$11,155	1,980	\$2,053
Elastic fabric				
From Austria-Hungary	26,400		880	
Germany	20,620		5,220	
Other countries	26,520		26,520	
Totals	73,540	\$114,140	33,100	\$48,528
Other forms	7,000	8,740	400	\$1,140
Latex	67,320	\$35,484	10,600	\$1,845
Rubber coated fabrics	27,720	\$40,180	100,240	\$114,484
Other forms				
From Austria-Hungary	51,480			
Great Britain	51,700		47,980	
Other countries	44,600		3,500	
Totals	147,780	\$85,172	52,480	\$82,528
Rubber boots and shoes				
From Austria-Hungary	3,680		1,540	
France	370		3,220	
Germany	4,260		4,250	
United States	3,488		53,743	
Other countries	3,430		1,024	
Totals	16,326	\$27,043	63,775	\$49,234
Elastic webbing				
From Austria-Hungary	2,400		5,720	
France	5,300		2,760	
Germany	106,400		27,800	
Other countries	38,940		24,640	
Totals	259,160	\$362,766	80,360	\$112,710
Tires				
From France	950,180		408,760	
Germany	1,500,080		2,300	
Great Britain	365,900		262,020	
Russia	177,900			
Other countries	65,120		105,160	
Totals	2,788,940	\$3,400,858	778,580	\$929,407
Other rubber manufactures				
From Austria-Hungary	108,240		13,640	
France	26,400		1,611,240	
Germany	323,520		63,360	
Great Britain	192,280		1,085,480	
Other countries	38,060		1,296,240	
Totals	684,500	\$301,562	4,070,000	\$1,785,250
Total Imports		\$8,712,888		\$10,757,878

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNCLASSIFIED—				
India rubber and gutta percha—				
—raw and reclaimed—				
Rubber scrap	\$95,980	\$133,323	\$720,080	\$163,098
	\$37,920	\$20,751	\$6,080	\$2,415
MANUFACTURED—				
India rubber and gutta percha—				
—sheets—				
To Austria-Hungary	1,460			
Germany	45,840		5,720	
Great Britain	4,600		2,960	
Russia	2,420			
Argentina	2,420		7,040	
Other countries	25,300		64,900	
Totals	82,040	\$132,706	79,640	\$135,758
India rubber and gutta percha—				
—fabrics—				
Cut sheets	7,460	\$9,626	14,520	\$19,234
Elastic fabric	880	270	1,980	608
Insulated wire			1,160	268
Hard rubber		540	20,680	12,699
India rubber and gutta percha—				
—other forms—				
Cut sheets	800	\$1,312	14,740	\$21,082
Latex	34,980	15,036	98,120	1,120
Germany	55,880		75,240	36,303
Russia	11,000	6,137	11,620	3,242
Argentina	2,420		62,420	78,800
Other countries	2,420		30	
Totals	110,800	\$310,652	400,180	\$561,707

TIRES				
From Austria-Hungary	1,195,700			
France	54,780			
Germany	111,760			
Great Britain	645,920			
Other countries	4,581,720			
Totals	6,589,880			
From Austria-Hungary	403,700			
Germany	33,420			
Argentina	434,720			
Brazil	87,560			
Other countries	629,420			
Totals	8,239,100	\$6,934,371	8,721,680	\$10,635,295
Other rubber manufactures				
From Austria-Hungary	133,540		61,600	
Germany	81,220		90,640	
Argentina	259,820		434,063	
Other countries				
Totals	474,580	\$295,847	586,303	\$365,185
Total Exports		\$7,001,893		\$10,635,295

IMPORTS OF CRUDE RUBBER AND BALATA AT BORDEAUX, FRANCE.

	January	February	March	April
From Austria-Hungary	185,900	314,600	185,900	185,900
France	185,900	314,600	314,600	314,600
Germany	185,900	314,600	314,600	314,600
Great Britain	185,900	314,600	314,600	314,600
Other countries	185,900	314,600	314,600	314,600
Totals	740,000	1,278,000	1,278,000	1,278,000

THE RUBBER SCRAP MARKET.

NEW YORK.

It would appear that the rubber scrap market has maintained a fairly steady position during the entire month despite the unfavorable influence reflected by the declining rubber market. Early in the month boots and shoes were firm at 8½ cents and dealers refused offers around 8½ cents from the reclaimers, and in some cases as high as 9 cents was asked. Steady buying was noticed the first week of the month on the part of several large dealers who evidently believed the present market has reached the bottom, and it was freely predicted that the reclaimers and rubber mills would be in the market before the end of the month. It is believed that there has been considerable tentative buying on the part of these interests which would substantiate this forecast.

The tire situation has been limited to small transactions controlled through price concessions by those who were anxious to sell, however, the dealers, for the most part, have asked 8½ cents for white G. & G. tires, delivered. Other grades of tires were unchanged, and No. 1 inner tubes were nominally 29 cents. The mechanical grades developed a tendency early in the month to lower prices, as buyers were not so keen for supplies as they were a week ago.

By the 20th of the month certain grades exhibited strength, particularly boots, shoes and arctics, due to the recent curtailment of arrivals. Boots and shoes were going in good volume at 9 cents delivered, though some dealers held out for 9½ cents. Arctics developed a firm tone in sympathy, the leading trimmed grades being delivered to the mills for 7 cents.

In white G. & G. tires the situation had not changed materially, though sales at 8½ cents delivered were reported. Mixed tires presented the anomaly of dealers buying at 6 cents and selling at 6½ cents delivered. Bicycle tires moved freely at prices ruling between 4½ and 4½ cents. Inner tubes were dull and easier in price, the No. 1 grade being quoted nominally at 27½ cents. White mechanical scrap appeared to move freely at prices ranging between 14½ and 15½ cents delivered, while the other grades failed to attract any interest whatsoever. There is no demand for garden hose, and the other grades were exceedingly dull.

A special form of rubber guarantee has been issued by the British consul at New York for use by the reclaimers. The rubber scrap dealers will continue to sign the same form.



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RUBBER TIRE IMPORTS INTO THE STRAITS SETTLEMENTS.

The Registrar of Imports and Exports at Singapore, Straits Settlements, recently furnished to the British Board of Trade interesting statistics which show the share of Great Britain, Continental Europe, Japan and the United States in the importation of "competitive merchandise" into the Straits Settlements during the year 1915.

Under the heading "Rubber Tires," these statistics show that out of total imports from the four sources above mentioned, amounting to 2,199,000 Straits Settlements dollars [\$1,231,440], Japan's share was 1,037,000 Straits Settlements dollars [\$580,720], Great Britain's share was second in importance, amounting to 574,000 Straits Settlements dollars [\$321,440], Continental Europe ranked third with 572,000 Straits Settlements dollars [\$320,000], while the share of the United States was only 16,000 Straits Settlements dollars [\$8,960].

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TABLE OF CONTENTS ON LAST PAGE OF READING.**THE CENSUS OF INDUSTRY.**

THE best fighting force in the world is useless without arms, ammunition, food, clothing, medicines and transport. It is with these facts in view that the Committee on Industrial Preparedness of the Naval Consulting Board of the United States is taking an inventory of the resources of manufacturers of such lines as would be needed in war. It is also planning for the development of increased efficiency in lines that are not up to the requirements.

Many factories whose products cannot be considered war necessities, have machinery easily adaptable for the production of war materials. A part of the comprehensive plans of the commission is to make these potential forces practical. It is proposed that the normal requirements of our army and navy be so divided and distributed that every plant capable of such manufacture be given a share at cost, plus a reasonable profit. If these requirements are not sufficient for this purpose, such goods as would not deteriorate might be made and stored

for later, or emergency, use. In order to encourage those factories which are not now making war materials, they may be given sufficient orders to justify adapting enough of their present equipment, and training portion of their help, to such manufacture, so that they will have a practical knowledge of such work, and can quickly turn over more of their machinery, and instruct a larger proportion of their help, to greatly increase their output of these lines should occasion demand.

Every rubber mill is now, or could be quickly equipped with the machinery needed to furnish necessary material for use in time of war. The proofing of fabrics for tents, ponchos, ground sheets, etc., and of textiles for balloons and aeroplanes; the preparation of hospital sheetings; the manufacture of druggists' and surgical sundries; the making of automobile truck tires, and the production of footwear and insulated wire are all regular lines of the rubber industry which would be called for in case of war.

As a preliminary move, rubber manufacturers are being requested to supply answers to a series of questions regarding their business for the industrial inventory. This information is to be held strictly confidential, and the work is non-partisan, non-political, and wholly patriotic.

Among the questions to be answered are the names of officers, principal stockholders, and directors, and whether each of these is an American citizen, and if not, what is his native country. Much detailed information is requested as to the value of land, buildings, machinery, tools, equipment and merchandise; a full description of the plant, with its ground plan and total floor areas; with a list of apparently non-pertinent questions as to feeding, housing, and caring for employees, the number of the latter and their nationality; whether they are union or non-union, whether the work now done by men could be done by women; kind and amount of material used, and from whom purchased; principal products manufactured, and amounts; where and how marketed, details of shipping, etc.

The form supplied for recording all this information is rather formidable. Were each manufacturer able to answer the questions offhand it would be a task of considerable size. This, however, will be attended to by volunteer workers, trained men of technical education.

No doubt the rubber trade will respond freely and fully, and—this for a guess—it will be found already equipped with men and machinery capable of furnishing supplies faster than men could be recruited to use them.

A PROTEST FROM LONDON.

THE increase in purchases of crude rubber in the Far East by representatives of American manufacturers for direct shipment to this country is viewed with some alarm by English rubber interests.

A recent issue of the "Financier" thus sums up the situation: "America uses about 90,000 to 100,000 tons of rubber a year. With the increase of mechanical traction, this quantity within the next few years, will probably be trebled. Towards this consumption of 100,000 tons, London exported to the States—according to the official statistics—no less than 40,000 tons. The whole of this business is directly affected if the Rubber and Tin Exports Committee continues its present policy. Let there be no illusion upon the subject. If this great trade is, during this time of stress, allowed to pass from our hands, it will never be regained."

The writer contends that no national purpose is being served by the policy adopted by the exports committee, and its efforts to prevent rubber reaching enemy hands are resulting in a very maximum of damage to British trade interests, with no corresponding advantage. He quotes from "a well-known authority" as saying "To help the Americans to obtain control of an essentially English industry is not to beat the Germans, and, as a matter of fact, it will suit German-Americans far better to buy in the East than to have to come to London for their supplies."

The "Financier" claims that there are 10,000 tons of rubber in England, besides cargoes unloading from the Far East, so there is no question of shortage; and furthermore, that this condition has brought about the recent decline in the price of rubber, and the consequent effect upon Eastern exchange; and that the whole rubber trade is demoralized by the existing uncertainty. The article suggests that "the sooner the Rubber Growers' Association and the Rubber Trade Association bring pressure to bear upon the committee to secure a more enlightened policy, the better for the present and future prospects of the rubber industry. It may be that these august bodies have already moved in the matter. If this be so, and a redress of grievances is not speedily obtained, it is to be hoped that they will jointly put forward an official remonstrance on the subject."

At first blush it would seem as if London had no reason for this protest—that she stood in the place of an expensive middleman who could and should be eliminated with speed and despatch; that if rubber sold in Singapore and bought in New York were held up by London, it might as justly be held up also by other English ports as Penang, Colombo, Aden and Port Said. Such reasoning

would, however, fail to take into account the important service rendered in making the present plantation industry possible. Through the most generous financing, and broad gage handling, the great producing plantations in the Far East were created and brought to their present productiveness. London was more than a partner; it was a wealthy elder brother with wide open purse.

Then, too, the work of the Rubber Growers' Association, of the greatest value to the planters, always centered in London. The London crude rubber men in the past have been singularly fair and impartial, but with the great growth of the Singapore market there is bound to be a readjustment in selling and shipping. London might hinder direct shipments for a time, but would it be best for all concerned? The better the producers of plantation rubber treat their biggest and best customer, the tighter that customer will stick. The cheaper the rubber, the greater the market.

THE STRIKE EPIDEMIC.

THIS is a time of unrest in the industrial world. It is a rare day when the morning news does not include the institution of a strike in some large factory. This is a result of present productive prosperity. The European war requires tremendous amounts of munitions, arms and supplies, while the call to arms of millions of artisans in Europe causes an increased demand for American goods to fill the scarcity of foreign manufacture. There is an almost unprecedented demand for labor, skilled and unskilled. The industries in greatest need of workers naturally offer high wages, and thus draw to their establishments employees from other factories. To hold their help these latter must increase the pay, and then workers in other plants, not thus affected, become dissatisfied, and demand equally high compensation.

No line of manufacture is free from this disaffection of employees. The rubber trade is no exception. Generally speaking, rubber workers are paid as liberally as are most others for labor requiring equal intelligence, strength and skill. Some of the leading rubber manufacturing concerns have voluntarily increased the wages of their workmen. Others have granted full wages for a shorter working day. Some strikes have been settled by granting the full demands of the workmen. Others have been compromised.

But the present industrial prosperity cannot last indefinitely. When this war is over—and it must end some time—reaction must inevitably follow. Then, with a total cessation of demand for labor in many of these great munition factories, and a lessened call for products of other establishments, many thousands of workers, skilled and unskilled, will be thrown out of employment. And, as is the case with merchandise, so it is with labor, less demand and oversupply must result in a readjustment downward of the wage scale of today.

Cord Tires and Cord Tire Fabrics.

MODERN cord tires owe their origin to the thread fabric invented by John T. Palmer and first used in racing tires on bicycles in 1893. That Thomas J. Jeffery was first in the field with a thread fabric tire as claimed by some, cannot be verified, but it is true that fabric bicycle tires were made at Indianapolis by the G. & J. Tire Co. in the early nineties.

The name "cord" tire originated in England, where the principle was first applied to the manufacture of automobile tires in 1900. It was known as the Palmer cord to distinguish it from the lighter Palmer cord bicycle tire. The Silvertown cord tire

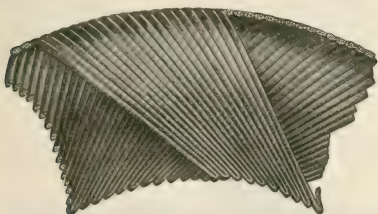


PALMER THREAD FABRIC.

was invented and patented by Christian H. Gray and Thomas Sloper of England, and manufactured at Silvertown, England, by the Palmer Cord Tire Co., and in the United States, under license, by The B. F. Goodrich Co.

THE SILVERTOWN CORD TIRE.

In this tire, the cords are built up from units of 24 threads that are separately impregnated with rubber and subjected to uniform tension. They are then cabled and the foregoing operation repeated until cords of the required sizes are produced, which are flattened in a machine specially constructed for the purpose. The two layers of these flattened cords are applied in the following manner: First, a layer of rubber is applied to the core—set in the tire building machine. A series of metal staples, 300 in number, are then placed at spaced distances around the inner edge of the bead ring. The cord is fed from a supply spool to a tension governor which regulates the de-



SILVERTOWN CORD.

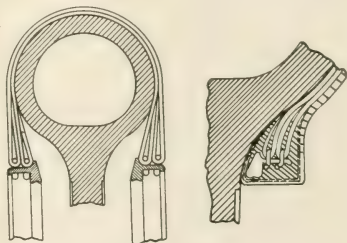
livery and maintains a reserve supply under uniform tension. A folding device measures off an exact length of cord and folds it into double loops which are seized by automatic fingers and placed diagonally on the core and, at the same time, on the bead staples. At the anchorage or smaller circumference of the tire the cords are arranged on edge, and as they approach the tread or larger circumference of the tire each cord is given a quarter twist so that it lies flat on that part of the core corresponding to the tread. When one complete layer is placed around the core, a layer of rubber follows, over which a second layer of cord is applied in the same manner as the first but at the reverse angle. Then another layer of rubber follows which completes the carcass.

THE DICKINSON CORD TIRE.

The principles embodied in this tire and the machine for con-

structing the carcass show effort on the part of the inventor to improve the art and practice of cord tire making. The separate strands of which the cords are composed are thoroughly impregnated with rubber which penetrates to the finest fiber. Thus a bond is created, not only between the cords but between the individual fibers of which the cord is composed, thereby preventing friction within the cord itself or between the separate cords. These are formed originally in flat section, the initial strength being retained; and the possibility of breaking the yarn fibers by application of pressure is obviated.

The cords are laid to a true helix under uniform tension on the tire core by a new automatic machine, in such a manner that the full area represented by the variable circumference be-

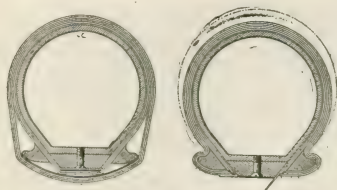


DICKINSON'S CORD.

ween the bead and tread is covered without packing, twisting, or distorting the cords. The cord loops are firmly anchored around the annular bead rings which are subsequently built into the carcass, thereby retaining the relative positions of the cords throughout the process of building and vulcanizing the tire. This method of construction permits curing the tire on the core, and therefore no distortion in the carcass occurs through the necessity of removing the core before a permanent bond is created between all the cords by vulcanization.

DEES CORD TIRE.

The Dees cord tire is built up on another new type of cord laying machine. The tire core is revolved and the rubberized threads are wound around it by a rotary winder in the form of a reel that carries the four thread bobbins and also the rubber solution cylinders. The threads are first impregnated with



DEES CORD.

rubber solution and then passed through rubber dough under pressure. They are then wound under tension around the core from one set of bobbins diagonally in one direction while the other ply from the other set of bobbins is wrapped diagonally

in the other direction, thus the threads of the two plies cross each other.

When the core has turned one complete revolution it is covered with a double ply of oppositely placed diagonal threads. Separator rings are applied to certain parts of the carcass and the thread winding operation continued. The separators prevent the different plies from sticking to each other so that the bead rings can be inserted and the carcass structure severed on the inner circumference in forming the beads and completing the casing.

WOVEN CORD FABRIC.

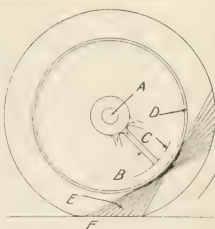
It can be safely said that with few exceptions, notably the Goodrich Silvertown cord tire, all cord tires now in use are made from a modification of the well-known thread fabric used in making hose pipe bicycle tires. It is composed entirely of cabled, parallel warp cords laid close together and without the usual filler other than small threads of soft, light yarn, spaced about one-half inch apart, that act as fillers but are only a temporary support to the web. In fact, the usual practice is to inflate an air bag within the unvulcanized casing that results in each cross thread being broken before the casing is finally cured.

Thirteen and one-half-ounce Sea Island fabric is generally used for the average cord tire, although 16½-ounce is recommended when size and excessive strain are factors to be considered. The fabric is coated on a spreader which applies several coatings of rubber to both sides of the web, the thickness of the solution and the number of coatings depending on the size and service required of the tire carcass. The spreading process not only impregnates the separated cords but preserves their alignment, which would be impossible in calendering. The fabric thus frictioned is skim-coated on the calender and then cut on the bias into strips of the required width and length. Thus it will be seen that all air is expelled from the fabric and the individual warp cords are imbedded in rubber, thereby reducing to a great extent the friction and consequent heating when the tire is subjected to air pressure and unusual strain due to fast driving.

There is apparently a limit to the size of the cord that can be successfully rubberized in cord fabric form. When the attempt was made to use a heavy warp cord in order to make up for the several plies made necessary by the use of lighter cord, the result was a failure, as the rubber could not be satisfactorily driven into the heavy 28½-ounce cord fabric.

PALMER'S FLAT CORD.

A development that grew out of the recognized imperfections in round cord, is a new type of ribbon or flat cord approximately one-half inch wide. According to John F. Palmer, these inextensible flat strips can be placed on the tire core at a true tangent to the rim, that is, at right angles to the spokes of the wheel.

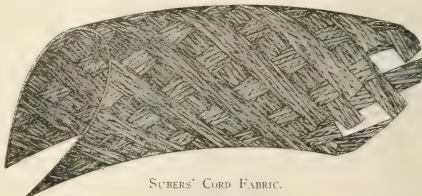


PALMER'S IDEAL TIRE.

This position gives the most efficient power transmission from the rim to the tread for the reason that force is best transmitted in straight lines. The illustration shows how the cords are tangent to the rim in the ideal flat cord tire. A represents the axle; B the spokes; C the felly and D the rim. The cords E, form a bridge construction supporting the tire at F.

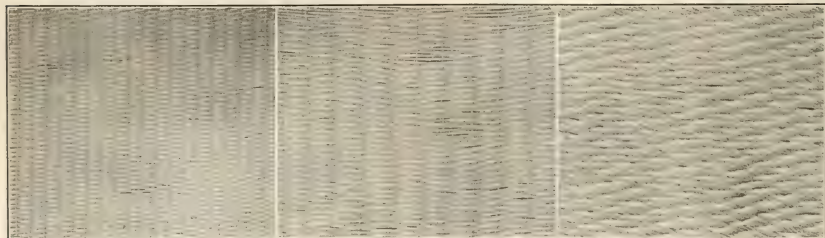
SUBERS' CORD FABRIC.

The inventions of Lawrence A. Subers follow closely along the lines of the cord principle in the development of a new laminated fabric that depends on a flat tubular fabric building strip. Moreover, the mechanical method of constructing the fabric is novel in principle. The fabric is made up of tubular bands, impregnated with rubber, that have alternating wide and narrow portions so that when it is made up in the form of a casing the wide portions will correspond to the tread and the narrow portions to the sides of the tire adjacent to the



SUBERS' CORD FABRIC.

beads. The fabric is laid, not braided nor woven, around an endless tubular mandrel corresponding in cross section to the general shape of a tire, by a machine that lays the strip around the moving mandrel at an angle of 45 degrees, while another layer of strip is simultaneously laid at opposite angles, forming a laminated tubular fabric. This fabric is slit on the inner circumference and removed from the mandrel in continuous lengths. These strips are of the correct width and shape to form the various plies of the tire carcass, which is built up on a separate machine.



13½ OUNCES.

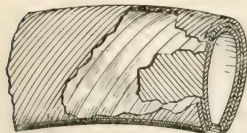
16½ OUNCES.

28½ OUNCES.

THREE TYPES OF CORD FABRICS.

LISTER'S CORD FABRIC.

Lister's tire fabric strip is made up of two layers of spirally wound rubberized cords, with the cords of one layer laid at an angle to the cords of the other layer and an intermediate layer of rubber formed by a spirally wound strip of rubber. The fabric strip is formed on a machine having a traveling core composed of an endless chain of segments of the same



LISTER'S CORD FABRIC.

cross section as the finished tire. The tubular strip thus formed is cut on its inner periphery, forming an open tube which is ready to be applied to the core of a tire building machine.

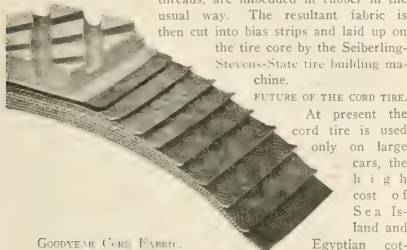
THE UNITED STATES "ROYAL CORD" TIRE.

The fabric used in the United States "Royal Cord" tire is woven with very strong warp and light, soft filler threads, the latter spaced about half an inch apart and serving only to hold the web in position during the preparation of the carcass. The rubber that is applied to the fabric and between each ply, forms a covering about each thread in such a way, that when the tire is completed, no thread touches nor chafes against another, and each thread bears its full amount of the inflation and strain.

In the manufacture of the "Royal Cord" tires, the fabric is first impregnated, so that all of the individual threads are thoroughly covered with rubber. By a special frictioning process, the spaces between the threads are then rubber filled, and, lastly, the surface is skim-coated with rubber. The tires are then built up on a core in the usual manner.

THE GOODYEAR CORD TIRE.

In the Goodyear cord tires a series of hard cabled parallel cords, without any cross weave other than the web-supporting threads, are imbedded in rubber in the usual way. The resultant fabric is then cut into bias strips and laid up on the tire core by the Seiberling-Stevens-State tire building machine.



GOODYEAR CORD FABRIC.

FUTURE OF THE CORD TIRE.

At present the cord tire is used only on large cars, the high cost of Sea Island and Egyptian cotton limiting its

field. It is said, however, that cheap and satisfactory tires made from Pécier cotton are a possibility, which would give the small car owner an opportunity to use them.

An indication of the present importance of the cord tire in the American trade is the prediction that 2,000,000 will be made during the coming year.

TIRE WEAR AND THE DIFFERENTIAL.

Whether the differential is necessary or only advisable on motor trucks is a subject of discussion in manufacturing circles. Some claim that though the present differential is far from satisfactory, it is a necessary evil, and it would not be wise to discard it. It is pronounced a heavy and expensive mechanism, which increases the cost of manufacture, of operation and of maintenance. But as regards wear of tires, there is not the slightest doubt that any vehicle not provided with a differential

must give unequal wear on the tires, so much so, in fact, that even with all its objections, the differential is still an economizer in maintenance.

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless, they are of interest, not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

[179.] Names of concerns handling guayule shrub are desired.

[180.] A correspondent wishes to secure one or more rubber trees of No. 1 quality for green-house novelty.

[181.] Names of manufacturers of "rubber foam" have been requested.

[182.] A foreign rubber manufacturer contemplates making tires and desires complete information on the subject.

[183.] An inquiry has been received for inner tube testing machines.

[184.] The name and address of a firm making and selling hard rubber beads is solicited.

[185.] Information regarding a solvent for balata is requested.

[186.] A correspondent desires the names of manufacturers of sponge rubber.

[187.] Makers of machines for covering metallic wire with rubber are sought.

[188.] A correspondent asks where wool and cotton flock can be obtained.

[189.] The name of a manufacturer of a machine for cutting designs in tread molds is requested.

[190.] Names of companies making aniline dyes suitable for rubber compounds are requested.

[191.] An inquiry has been received for a firm manufacturing rubber tile and interlocking rubber tile.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

An applicant in Spain desires to represent American manufacturers of india rubber goods. Report No. 21,273.

An inquirer in Norway would like to be placed in touch with American exporters of india rubber for dental purposes. Report No. 21,322.

A firm in Argentina wishes to receive quotations, descriptive catalogs, etc., from American manufacturers of rubber tubes for oxygen and acetylene gas under pressure, asbestos gloves, etc. Report No. 21,390.

Commercial relations with American manufacturers and exporters of rubber articles are desired by a firm in the Far East. Report No. 21,406.

An agent in the United Kingdom desires to communicate with an American manufacturer who can supply a loom or machine for weaving elastic hosiery, elastic abdominal supporters, etc. Report No. 21,409.

A commercial organization in Russia requests the names of American manufacturers of rubber erasers. Report No. 21,418.

Representation of American manufacturers and exporters of hospital supplies in rubber goods is sought by a firm in Italy. Report No. 21,419.

A firm of commission agents in Brazil seeks commercial relations with American manufacturers and exporters of rubber tires and other rubber goods. Report No. 21,471.

Representation of American manufacturers of surgical rubber goods is desired by an applicant in France. Report No. 21,590.

Automatic Control of Time, Temperature and Exhaust in Tire Vulcanizers.

PERFECT vulcanization is the final achievement in the many important steps that are necessary in making automobile tires. A uniform curing temperature is vitally essential in the production of a guaranteed product. Dependence on the carefulness and experience of an operator invariably challenges the well-known fallibility of human skill, and an automatic control that neither forgets nor becomes tired and careless is incomparable.

Such devices are doubtless well known in general to the trade; however, the following description of the principle and methods

of operating that are characteristic of the Tagliabue system will be of undoubted interest. The operating principle of these controllers is embodied in the primary parts that are described in the following text and illustrated in Figure 1: A capsular spring which expands and contracts in direct ratio with the temperature tendency within apparatus to which controller is attached; a transmitting lever for multiplying and transmitting this movement; a ball valve which is operated by the transmitting lever and which allows more or less air pressure to open or close the steam valve to a greater or lesser extent; air inlet and outlet connections for the air pressure which does the actual work of regulating the steam valve.

The capsular spring *A* is a phosphor bronze shell with a flexible top that when a temperature controller is involved is connected by flexible tubing with a thermostatic bulb, partly filled with ether. When the bulb temperature varies, the pressure of the vapor above the ether varies in accordance and moves the top of *A* in response to the merest tendency toward a change at the bulb. In the case of a pressure controller the capsular spring is directly connected to the controlled steam pressure.

The transmitting lever *B* is provided with an adjusting screw at the point where it contacts with the capsular spring. Advancing or withdrawing this screw, in connection with a dial and pointer arrangement, provides an ideal adjustment for higher or lower temperature maintenance.

The ball valve is extremely simple; it is sensitive and positive because frictionless and self-cleansing. When the temperature tends to go too high the consequent slight expansion of the capsular spring *A* and the resulting movement of the transmitting lever *B* allow the valve stem *D* to move upward. This increases the opening for the incoming air, which enters through *G*, and restricts the opening for the air which escapes past the pin *D*. Thus the air pressure on the diaphragm-motor steam

valve, through passage *F*, is increased, and the consequent closing movement of the steam valve checks the excess steam. The opposite effect occurs, of course, when the temperature tends to diminish and more steam is needed.

The compressed air affords an instant, flexible and powerful means for doing any amount of work required, especially when the steam temperature shows a mere tendency to change and when, therefore, the capsular spring moves only an infinitesimal extent.

The actual operation of the Tagliabue control system applied

to a tire press is briefly as follows, with reference, however, to Figure 2:

Figure 2 shows a tire vulcanizing press to which the following Tagliabue units are applied. The first is a compound controller which consists of two controllers housed in one case. One of these controllers maintains a uniform steam temperature within the press, while the other portion of the controller takes care of the exhausting or venting at the bottom of the press by periodically relieving the heater, not only of the water condensation, but of the supersaturated steam also. Another controlling unit is the automatic time controller which, after the vulcanizing period is at an end, automatically shuts off the steam supply and opens the exhaust wide. This can also be arranged to turn on cold water for flooding and cooling the contents of the press when

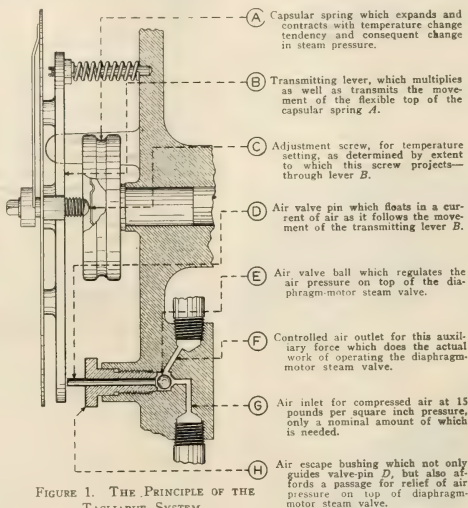


FIGURE 1. THE PRINCIPLE OF THE TAGLIABUE SYSTEM.

desired. At the same time this controller rings a bell, or otherwise signals the operator, that he may know the heater is blowing off and be ready to open and re-charge it with the least waste of time. Another unit is the recording thermometer, which gives a graphic record of just what the controllers have accomplished in the way of uniform temperature maintenance, the final units being the mercurial thermometers, which serve as a check on the recorder.

Assuming now that the operator has charged the heater and is ready to start the cure, he first steps up to his time controller and by means of the setting key turns the hand clockwise from the starting point to the exact time period required for the cure. Then he opens the hand valve which is between the steam supply source and diaphragm motor valve *B*, shown in the "Side View Showing Arrangement of By-pass." Steam now enters the heater and the hand of the time controller *K* will commence to travel backward, or counter-clockwise. At the start diaphragm-motor valve *B* will be wide open, but will gradually close as the temperature builds up within the heater until finally it will assume the exact throttling position required to maintain

the temperature for which the controller is set. When the steam first enters, it has little effect on the thermostatic bulb of the temperature controller *E* because of the rapid condensation, but as the molds heat up, the condensation becomes less and the thermostatic bulb transmits the temperature effect to the capsular springs of the temperature controller. This gradually expands and moves the transmitting lever within the controller, causing more and more compressed air to flow to the diaphragm-motor valve *B*, which assumes the throttling position mentioned. Should the steam pressure in the header *A* increase, causing the temperature within the heater to go higher, this effect is instantly transmitted to the controller, and more compressed air is allowed to enter the top of diaphragm motor valve *B*, which will close, thus checking the rise in temperature. If, on the other hand, the steam pressure within header *A* falls, the reverse will occur and the diaphragm motor valve will open wider.

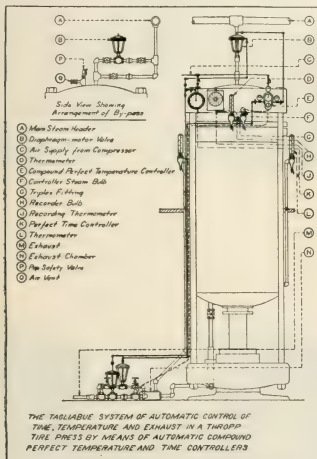


FIGURE 2. AUTOMATIC CONTROL APPLIED TO VERTICAL HEATER.

In the meantime the exhaust control portion of the controller *E* is intermittently draining the heater, because, as the condensation or the supersaturated steam, which is at a lower temperature, comes in contact with the thermostatic bulb of the latter it causes the diaphragm motor valve on the exhaust line to open, and the steam within the heater will eject the water and supersaturated steam. But when dry steam contacts with the thermostatic bulb it will cause the diaphragm-motor valve to again close. This occurs periodically during the vulcanizing period. During this time the hand of the time controller *K* has been slowly returning to the starting point. When the time is finally up this hand trips the time controller mechanism and compressed air, flowing through the time controller, with shut off diaphragm-motor valve *B*, the steam inlet valve. At the same time compressed air flowing to the "reverse acting" diaphragm-motor valve on the exhaust line will cause the latter to open wide, allowing all of the steam left within the heater to be vented out. In addition, as already mentioned, the operator is signaled so that he can unload the press and get ready for another cure.

The time controller can also be arranged, although it is not thus shown in Figure 2, so that it will cause a third diaphragm-

motor valve to open wide when the vulcanizing period is up, and cold water will flood the heater until the operator shuts off the water supply.

The water of condensation settles in the exhaust chamber *N* in Figure 2. This chamber has two outlets, as shown, each of which is provided with a diaphragm-motor valve, one of said valves being a direct acting and the other a reverse acting valve. The direct acting valve opens when the compressed air pressure is relieved and closes when the air pressure enters the top. This valve is in connection with the exhaust control part of the compound controller shown at *E* in Figure 2. When the temperature gets low this valve opens, thus venting the heater until dry steam comes in contact with the thermostatic bulb. The reverse acting valve mentioned is connected to the time controller, and, being reverse acting, remains closed while there is no air pressure on the diaphragm top. When, however, the time controller functions, and allows air to pass and flow to the top of this reverse acting diaphragm-motor valve, it opens wide and thus blows off the apparatus when the time period is up.

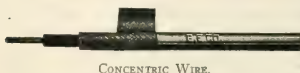
The same arrangement of units can be applied to a horizontal vulcanizer, used for curing treads, inner tubes or the open cure process. The functioning of the different units is exactly the same as already described.

THE CONCENTRIC WIRING SYSTEM.

There are in almost every city numbers of small houses which the owners will not have wired because the standard forms of wiring are more or less expensive, and with present methods of wiring it is necessary to disturb the wall decorations to obtain neat installations.

Rubber insulated wire of special construction, intended to be installed on the surface of the wall and to be covered with paint or paper, has been devised for wiring inexpensive houses.

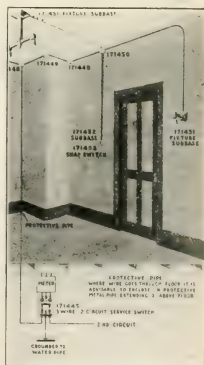
Bare concentric wire, so-called, has a single, rubber-insulated, solid wire for its inner



CONCENTRIC WIRE.

ner conductor. The outer conductor, or sheath, is composed of tinned sheet copper, folded longitudinally around the wire with a full lap, giving uniform, double thickness. The laps of the sheath are then soldered, forming a continuous water and gas tight jacket.

The special fittings are so arranged that joints can be quickly made by expert wiremen, and they are designed so that the grounded sheath is continuous throughout the system. Because of the possibility of injuring the rubber insulation on the wire, the use of solder is considered inadvisable. It is, of course, necessary that the outer sheath be carefully grounded at the service switch so that the whole system will be thoroughly grounded. The concentric wiring system can be installed only with a special permit from the local insurance bureaus or municipal inspection bureaus. [General Electric Co., Schenectady, New York.]



METHOD OF INSTALLING AND SPECIAL FITTINGS.

A College Course in Caoutchouc.

THE growth and development of the city of Akron has been due almost entirely to the strides made by the rubber industry. The great demand made by the factories of the city for college men, and the evident superiority of young men with theoretical knowledge and practical experience with rubber, were the incentives which caused the introduction of a course in the chemistry of rubber by the Municipal University of Akron.

The chemistry of rubber is still in its infancy, due to the nature of the hydrocarbon to be dealt with, and also to the comparative youth of the industry. Owing to the rapid development of the manufacture of all kinds of rubber articles, the



MINIATURE WASHERS AND MIXERS.

ingenuity of chemists has been taxed to develop processes, and to find adequate methods of control, both of the raw material and the finished products. The varied nature of the raw materials used in the manufacture of rubber broadens the scope of a chemist employed in this work to such an extent that there is hardly a branch of his profession which is not touched at one time or another.

This course at Akron is an advanced one, and to be taken only by men who have already had training in chemistry. The requirements for entrance are one year of general inorganic chemistry, one year of qualitative analysis, one year of quantitative analysis, and one year of organic chemistry. Men with such preliminary training should be in a position to fully comprehend the theories and understand the methods used in the analysis and manufacture of rubber.

The curriculum consists of lectures, conferences and laboratory work. The results of experiments which have been made to advance the theoretical knowledge in connection with the chemistry of rubber, from the latex to the vulcanized product, have been collected from different sources and are given to the student in the lectures. Their value and application are discussed fully, and, as far as possible, the development of the individual theories traced and applied to other branches of chemistry. The conferences consist in recitation work on subjects for which the student has been required to prepare himself by consulting various books and journals.

In the study of raw rubber, the botanical origin, the nature of the latex, its method of collection and coagulation, are taken up in the lectures. The different grades of raw rubber on the market are studied with the aid of samples. These are used for lecture work, and also for practical chemical analysis in the laboratory, where the student carries out the methods as used in the technical laboratories. To get acquainted with the practical factory side of the manipulation of crude rubber, the student is given a sample to prepare for use in compounding. Besides going through the general analysis, he washes the rubber on the

experimental washing mill and, after drying, calculates the loss due to washing and, from that, the cost of the rubber to the manufacturers.

Besides taking up the general nature of the pigments, fillers, diluents and the well-known accelerators, a study of their chemical properties and methods of manufacture is gone into. If they are obtained as by-products in some other industry, these industries are reviewed as far as the time allows. The general methods of analysis for factory control are discussed, and carried out in the laboratory with samples which will later be used in actual compounding. Emphasis is placed upon the great value of the relation between the specific gravity of a substance and its cost per pound.

The methods of analysis of vulcanized rubber as used today are fully discussed and carried out in the laboratory. Thus the student becomes acquainted with the various forms of apparatus used in the analysis, and also gets a working knowledge of such methods as give comparatively good results.

The theories on compounding and vulcanizing of rubber are taken up in lecture and conference work. In the laboratory the student carries out these processes from a practical factory point of view. The rubber laboratory is equipped with modern standard mixing mills, a vulcanizing press, a steam vulcanizer heated by a smaller boiler, which can be regulated to any practical vulcanizing temperature desired, and a tensile testing machine. As the cost of a compound, together with its specific gravity, is a most essential factor in rubber manufacture, the method of calculation from the cost and specific gravity of the raw materials is gone into and the importance discussed.

The student first makes up simple standard compounds, vulcanizes them, and, after getting the tensile strength, calculates



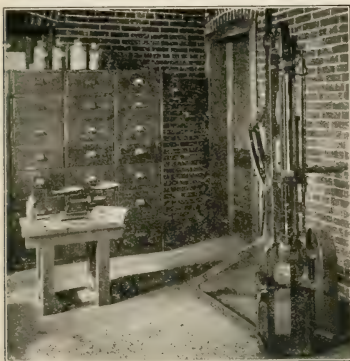
MINIATURE PRESS AND VULCANIZER.

the volume cost from the raw products used. A check is obtained by determining the specific gravity of the finished product. After he is familiar with the manipulation of the rubber compounding he is given problems in making up formulae having given properties and given volume costs. By actual compounding and vulcanizing, the practicability of the formulae is determined. In this way he becomes familiar with practical factory problems.

During the year, by courtesy of the Akron rubber manufacturers, the students inspect all of the larger factories in the city where the processes, which cannot be carried out in a small

laboratory, are explained. Many of the students also spend their summer vacations working in different departments of the various factories in the city.

It is not the aim of the Municipal University of Akron to graduate experts on the chemistry of rubber. The limit of time



TESTING MACHINE.

allowed for the course permits only the teaching of the fundamentals. But with this preparation the student should be able to develop into a valuable rubber man, whether he be of the laboratory, factory or sales force.

The success of the course is shown by the fact that calls for graduates are received from all parts of the United States, and that these graduates have been uniformly successful in holding the positions thus obtained.

The course is in the direct charge of Professor William F. Zimmerli.

SCHOOLS FOR TIRE REPAIRERS.

THE business of repairing automobile tires, as many a car owner knows, is not one to be entrusted to any chance mechanic who happens to own an obsolete vulcanizing apparatus. In order that those to whom this work is entrusted shall know their business more thoroughly, special schools of instruction have been instituted and courses prescribed which will fit these men to do such work in a proper and efficient manner.

The Goodyear Tire & Rubber Co., Akron, Ohio, has instituted such a school where they teach men, free of charge, the art of repairing tires under practically the same conditions that are apt to obtain in their own workshops. A complete practical course is furnished. Beginning with fundamentals, every step in scientific tire repairing is demonstrated by expert teachers, and actual practice is given in the latest approved methods, so that when these students have completed their course it is stated they will be qualified to undertake any kind of repair job, from a puncture to a re-tread.

A picture of this tire repair school is shown herewith. At the left in the picture a buffing wheel is in operation. Next is shown the instructor demonstrating the use of a vulcanizer to an attentive student. In the center of the picture is shown a student placing the tire on the rim and, further to the right, another measuring fabric for repairing the carcass; while in the rear are to be seen other operations in tire repairing.

A similar institution is that of the Haywood Tire & Equipment Co., Indianapolis, Indiana, manufacturer of tire repair apparatus. In this school a ten days' course is given, covering personal, practical instruction in the making of every kind of tire repair, the rational use of the machinery, tools, etc. For those desirous of securing this practical education, but who live at too great a distance from the school, a correspondence course has been provided. A recent class included people from nine different states, from Vermont on the north to North Carolina at the south, who came to Indianapolis to secure instruction in what has been for many of their predecessors a profitable, useful and steadily increasing business.

A more ambitious plan, perhaps, than either of the above, is that of the Akron Tire Repair School which was incorporated May 15 of this year, with a capitalization of \$10,000. It occupies a building 29 by 125 feet, two floors and a basement. The second floor is used as a lecture room, the first floor for offices and equipment and teaching of actual repairs, and the basement for stock and storage.

The plan of this school is to obtain students through advertising who will come to Akron and for two weeks be instructed in the lecture room, where they will be shown by actual building the construction of the tire. This will be accompanied by general instruction regarding rubber, from its gathering and handling to the processes it goes through to reach the completed tire. Then will come instructions regarding the different troubles that come to a tire which will be shown by actual samples. The student is shown how to tear down and build up a tire for repair. After this course in the lecture room, the students will be taken into the shop where they will do actual work under trained teachers.

The repair shop is equipped with the Akron-Williams outfits made by the Williams Foundry & Machine Co., and will carry a complete line of these outfits for repairing tires. This shop will do the repair work on tires for a part of the 9,000 machines which are operated in and around Akron.

After the mechanical instruction has been completed, the business end will be taken up and instruction given in the merchandizing and financing ends of the business, the bookkeeping and routine of records, etc., being fully taught.

These schools are fitly situated in tire manufacturing centers. Their progress will be watched, and if they prove profitable to



A TIRE REPAIR CLASS AT THE GOODYEAR WORKS.

scholars and managers, it is more than likely that their example will be followed, and similar schools instituted in other sections, to provide for those who would find it inconvenient to travel so far in order to get the principles and rudiments of this comparatively new but very important industry.

What the Rubber Chemists Are Doing.

VULCANIZATION OF CAOUTCHOUC BY MOLECULAR OXYGEN.

THE researches of I. I. Ostromyslenski have shown that the action of ozone in vulcanizing caoutchouc depends on the preliminary formation of the caoutchouc ozonide. The ready-formed ozonide has an effect similar to that of ozone, both soft and hard resins being formed. The course of the process is chiefly determined by the concentration of the vulcanizing compound. When caoutchouc is exposed in an atmosphere of dry air to the ultra-violet rays of a quartz mercury lamp, it undergoes gradual vulcanization, increasing in weight at the expense of the oxygen. At 104 to 176 degrees F. this process takes place with fair rapidity, but at 248 degrees F. no vulcanization occurs.

Vulcanization of caoutchouc by means of its ozonide takes place under the same conditions as vulcanization by benzoyl peroxide.

In the presence of moisture, chemically pure caoutchouc activates molecular oxygen and thus behaves like most of the terpenes. Thus, moist isoprene—or erythrene, caoutchouc of the normal series, when left in the air at ordinary temperature, gradually becomes covered with a layer of new, less elastic substance, this process being analogous to the drying of vegetable oils. If normal erythrene-caoutchouc, thus coated, is milled on cold rolls to render it homogeneous, and then heated in the ordinary way in the absence of air, the unchanged caoutchouc undergoes vulcanization. If, however, this surface is first removed, vulcanization does not take place. Evidently this layer, consisting of a product of the action of atmospheric oxygen on the caoutchouc, constitutes the vulcanizing substance.

The vulcanization of caoutchouc by its halogenides or ozonides is purely a physical process and is comparable with the formation of cellulose. The latter process may be regarded as vulcanization of cellulose esters by camphor, etc.

The large number of known vulcanizing agents indicates that the chemical nature of these plays no determining part. All these agents form colloids with the caoutchouc, and it is by these colloids that vulcanization is effected.

VULCANIZATION BY NITROBENZENES.

Dr. H. P. Stevens has endeavored, without success, to repeat the results of Ostromyslenski in the vulcanization of rubber by the use of nitrobenzenes (see THE INDIA RUBBER WORLD, May, 1916).

His method was as follows:

A mixture was made, in the ordinary way, of 100 parts raw rubber and 2 parts of powdered dinitrobenzene. A control sample of rubber alone was prepared. Both samples were vulcanized, under cover, in steam for 3 hours at 275 degrees F. Comparison after this treatment showed no apparent difference between the samples, neither being vulcanized in the slightest degree. The rubber was simply lifeless and without nerve, same as when overmasticated and heated. The result seems to indicate, contrary to the announcement of Ostromyslenski, that dinitrobenzene has no vulcanizing property and is unable to replace sulphur in vulcanization.

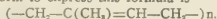
ORGANIC PIGMENTS IN VULCANIZED RUBBER.

Most organic pigments are practically unavailable for coloring hot vulcanized rubber, because at high temperature, in the presence of sulphur, they readily decompose with loss of color. A method of special value in the manufacture of rubber articles, colored with such pigments, has been devised by I. I. Ostromyslenski, which permits vulcanization at the ordinary temperatures in the presence of sulphur, an amine, and an oxide. Certain organic pigments are not decomposed when heated either at a compara-

tively low temperature, or even at that of ordinary vulcanization, provided that the heat is maintained for only a short time. In such cases the process permits acceleration of the vulcanization or lowering the temperature employed. Experiments were made with eosin, erythrosin alkali blue and cinnamylidene-fluorene. In the case of erythrosin, a mixture of 3 parts of the dyestuff, 10 of caoutchouc, 2 of magnesium oxide, 0.8 of sulphur and 0.2 of piperidine-piperidylidithiocarbamate, after cool mixing, was completely vulcanized in iron molds in ten minutes at 284 degrees F. Similar results were obtained with the other dyestuffs mentioned.

THE STRUCTURE OF CAOUTCHOUC.

Doctor Samuel S. Pickles in the "India Rubber Journal" (May 6, 1916) has briefly stated his views on the structure of caoutchouc, a summary of which is that the molecule consists of a large number of C_8H_8 complexes. Natural rubber contains at least eight of these units and the ring is a 32-carbon ring. The simplest form to express this formula is



The chemical reasons why the ring, rather than the open chain form of molecule is preferred are (1) Caoutchouc combines with only two bromine atoms for every C_8H_8 complex which it contains (Weber); (2) Caoutchouc can be so oxidized that the whole of its carbon atoms appear as derivatives of levulinic-aldehyde and levulinic acid (Harris). Assuming the correctness of these two observations, the closed ring follows as a corollary. The bulk of the evidence and the weight of opinion are at present strongly in favor of the large ring formula for caoutchouc.

ANALYTIC REACTIONS OF ISOPRENE.

THE presence of isoprene formed in a reaction of a diolefin with conjugated linkings is detected by I. I. Ostromyslenski by shaking 5 to 10 drops of the products of the reaction for a short time with 50 cc. of concentrated aqueous sulphur dioxide solution, the mixture being then left at the ordinary temperature in a hermetically sealed vessel. In the course of 2 to 30 hours an abundant, colorless, amorphous precipitate is formed. This consists of a compound of the diolefin with sulphur dioxide possessing characteristic properties.

Isoprene may be determined quantitatively by converting it into 1,3-dichloroisopentane. If a gram of the dichloroisopentane compound be obtained from S grams of the crude isoprene, the latter contains $3403 a \times 70.49 S$ per cent isoprene. The procedure is as follows: 200 grams of the crude isoprene, containing butylenes, amylenes, benzene, etc., with boiling point 86 to 104 degrees F., is energetically shaken with 1500 cc. of fuming hydrochloric acid for 6 hours in a mechanical shaker. The black, opaque upper layer of chloro-compounds is separated, washed with aqueous sodium chloride solution saturated in the cold, again separated after the emulsion formed has separated into two layers, dried over calcium chloride and distilled. At 104 to 122 degrees F. only two or three drops of hydrocarbons generally distil over, and the fraction 122 to 194 degrees F. contains butylene and amylene chlorides. The fraction 194 to 266 degrees F. is collected separately. From 266 degrees F. the temperature usually jumps immediately to 288 degrees F., the boiling point of the 1,3-dichloroisopentane. When the crude isoprene has been obtained, for example, from turpentine, the 1,3-dichloroisopentane cannot be distilled, but it is found that the residue distilling with boiling point beyond 291 degrees F. consists, in spite of its black color, of almost chemically pure 1,3-di-

chloroisopentane. This residue may be filtered through glass wool and the filtrate weighed. The fraction boiling at 194 to 266 F. is subjected to careful fractional distillation, as it contains 1,3-dichloroisopentane, sometimes in considerable quantity. The fractionation is carried out three times in each case up to 288 degrees F.

ANALYSIS OF LITHOPONE.

THE tentative methods of the American Society for Testing Materials for the analysis of lithopone are as follows:

INSOLUBLE MATTER. Take 1 gram of the sample in a 200 cc. beaker, add 10 cc. of concentrated hydrochloric acid and mix. Add in small portions about 1 gram of potassium chlorate; then heat on steam bath until about half of the liquid is evaporated. Dilute with water, add 5 cc. of dilute sulphuric acid (1 part of acid to 10 of water); boil, settle, filter, wash, ignite, cool and weigh the insoluble matter, which should be only barium sulphate.

TOTAL ZINC. The filtrate from the insoluble matter is made alkaline with caustic soda, acid with hydrochloric acid, add 3 cc. of concentrated hydrochloric acid, dilute to about 250 cc. with water, heat nearly to boiling, and titrate with potassium ferrocyanide solution and calculate to zinc.

ZINC OXIDE. Treat a 4 gram sample of lithopone for 4 hours with 200 cc. of 1 per cent acetic acid at ordinary temperature, stirring occasionally. Filter by suction on a double filter paper and wash with cold water; add to the clear filtrate 13 cc. of concentrated ammonia water, neutralize with hydrochloric acid, and then add 3 cc. of concentrated hydrochloric acid in excess; heat to boiling and titrate with potassium ferrocyanide, using uranium acetate solution as an outside indicator. Calculate to zinc oxide. Calculate this result to zinc, deduct from total zinc, and calculate difference to zinc sulphide. Zinc carbonate or zinc sulphate is included in the zinc oxide.

ZINC SULPHIDE. Place 0.5 gram of pigment in evolution flask with about 10 grams of mossy zinc, add 5 cc. of water; insert the stopper carrying a separatory funnel and an exit tube. Run in 50 cc. of concentrated hydrochloric acid from the funnel, having previously connected the exit tube to two absorption flasks in series; first flask contains 100 cc. of alkaline lead nitrate solution, second flask 50 cc. of same as a safety device. After all of the acid has run into the evolution flask heat slowly, finally boiling until the first appearance of steam in the first absorption flask; disconnect, let the lead sulphide settle, filter, wash with cold water, then with hot water till neutral to litmus paper and washings give no test for lead. The lead sulphide precipitate is dissolved in hot, dilute nitric acid, evaporated to fumes with sulphuric acid, and finally weighed as lead sulphate. Calculate to zinc sulphide.

The alkaline lead solution is made as follows: Into 100 cc. of potassium hydrate solution (56 grams in 140 cc. of water) pour a saturated solution of lead nitrate (250 grams in 500 cc. of water) until the precipitate ceases to redissolve, stirring constantly while mixing. About 3 volumes of the lead solution will be required for one of the alkali.

Instead of absorbing the evolved sulphuretted hydrogen in alkaline lead nitrate solution, a solution of 8 grams of cadmium chloride in 250 cc. of water and 150 cc. of ammonia water (sp. gr. 0.90) may be used. The cadmium sulphide precipitated, may be filtered on a weighed Gooch, washed with water containing a little ammonia, dried at 212 degrees F., and weighed. Calculate to zinc sulphide. It is better to filter the cadmium sulphide on a small filter and wash as above, then place filter and precipitate in a beaker and dissolve in hydrochloric acid and potassium chlorate (keeping at room temperature at first); filter out any paper pulp or insoluble matter; make filtrate alkaline with ammonia water, then just acid with hydrochloric acid, heat to boiling, and precipitate with barium chloride in the

usual manner. Filter, wash, ignite and weigh as barium sulphate. Calculate to zinc sulphide.

For very rapid work the contents of the absorption flask, after all sulphuretted hydrogen has been absorbed, may be washed into a vessel with cold water, and diluted to about one liter, acidified with concentrated hydrochloric acid, and titrated with standard iodine solution, using starch indicator. (The precipitate should be completely dissolved.) The iodine solution is prepared by dissolving about 12.7 grams of pure resublimed iodine and 18 grams of potassium iodide in a little water, and then diluting to one liter.

TESTS ON LITHOPONE.

COLOR. The color of the dry pigment should be compared with a standard sample of pure dry zinc oxide and a standard sample of lithopone that has been kept in a colored glass jar protected from light. Portions of these samples should then be ground in light-colored linseed oil and again compared for whiteness.

OPACITY. The relative opacity or "dense" character of the samples may be determined by making small batches of paste paint with mortar and pestle. To 25 grams of lithopone add 2 grams of 98 per cent red oxide of iron. Use about 10 grams of raw linseed oil (pale) for grinding. Brush out a sample of the paint upon a strip of glass in comparison with others prepared in the same manner. The most "dense" grade of lithopone will give the lightest effect.

TESTING RUBBER INSULATION.

In testing rubber insulation according to the "Underwriters' Specifications, Aaron Arthur Laddon, Chicago, Illinois, has found that samples taken from the same coil showed marked variation in strength and elongation. The wire had been in stock some time and the tests were carried out with the idea of putting it in with the new stock, provided the insulation had not deteriorated.

Samples 5 inches long were taken from each coil. They were rolled between two blocks of wood to loosen the insulation. The rubber could then be slipped off the wire. The insulating material was then tested for elongation, stretch and tensile strength.

The results varied as much as 100 per cent, and in only six coils out of 52 did the samples check.

The trouble did not lie in non-uniformity or deterioration of the rubber compound, as was first supposed. The method of separating the wire from the insulation was at fault. No matter how carefully the samples were rolled between the two blocks, the insulation could not be removed intact. In places it would stick to the wire.

A new method was therefore devised for removing the insulation. The wire was tinned copper. Tin amalgamates with mercury very easily and forms a very slippery surface on the copper. The mercury has no effect on the rubber compound. About 1/4 inch of insulation was cut off of each end of the samples and the stripped wire scraped to remove dirt and grease. The ends of the samples were then immersed in mercury. After a period of time, varying from 4 to 24 hours, the insulation could be slipped off the wire with almost no effort.

This method is being used by one of the largest electrical manufacturers in the country. Besides the accuracy and uniformity of results accompanying the application of this property of mercury, the cost of the testing has been reduced by over one-third.

A NEW SOURCE OF ANTIMONY.

Alaska, during 1915, shipped to San Francisco about 800 tons of antimony, chiefly from the region about Fairbanks. Four deposits are being worked on a small scale. The mineral is found in pockets and contains 50 to 58 per cent of metallic antimony. This discovery is not remarkable, since antimony is frequently found in abundance in gold bearing strata.

* A circular issued by Henry A. Gardner, Director, Scientific Section, Educational Bureau, Paint Manufacturers' Association.

CHEMICAL TREATMENT OF RUBBER.

UNITED STATES PATENT.

ADHERING RUBBER TO FABRIC. The process of uniting fabric or fibrous material and a rubber compound containing a vulcanizing medium consists in treating the fabric with a non-vulcanizing medium, non-detachably associated with the fabric and which has greater adhesion for rubber than the fabric, and finally vulcanizing the rubber to the fabric. [United States patent No. 1,184,015. Raymond B. Price, assignor to Rubber Regenerating Co., Mishawaka, Indiana.]

SYNTHETIC CAOUTCHOUC. By this process there is heated in a closed vessel, with an acid reagent, a distillate, obtainable by cracking pinene into various hydrocarbons by passing it, in the form of vapor, through a tube heated to a temperature, of between 572 degrees and 662 degrees F., and then cooling quickly, and distilling the hydrocarbons. The resultant mixture is heated in a closed vessel, thereby creating pressure and maintaining the temperature constant while the pressure drops, and until the pressure reaches a point where it remains substantially constant, distilling off the volatile matter, and oxidizing the residue. [Eva Gottschalk, Newark, New Jersey. United States patent No. 1,185,654.]

THE UNITED KINGDOM.

SUBSTITUTE FOR CELLULOSE OR LEATHER. India rubber is converted into a chlorine derivative by dissolving it in carbon tetrachloride or other solvent, which does not react with chlorine, but is a solvent of the product to be obtained, hydrocarbons being excluded; and treating with chlorine, or a gaseous mixture containing chlorine. A filling agent, such as camphor, may be incorporated with the material. The solvent is removed by evaporation or distillation, or the new derivative may be precipitated by alcohol or other miscible solvent which has no solvent action on the substance. [S. J. Peachey, Stockport, England: British patent No. 1,894 (1915).]

OTHER CHEMICAL PATENTS.

UNITED STATES.

- 1,187,229. Process of making condensation products of phenols and formaldehyde. L. H. Bakeland, Yonkers, N. Y., assignor to General Bakelite Co., New York City.
- 1,187,230. Reaction product of hexamethylenetetramine and phenolic bodies and method of making same. L. H. Bakeland, Yonkers, N. Y., assignor to General Bakelite Co., New York City.
- 1,187,231. Phenolic condensation product and method of making the same. L. H. Bakeland, Yonkers, N. Y., and N. Thurlow, New York City, assignors to General Bakelite Co., New York City.
- 1,187,232. Process for making insoluble bodies derived from phenol alcohols. L. H. Bakeland, Yonkers, N. Y., assignor to General Bakelite Co., New York City.

DOMINION OF CANADA.

- *167,969. Rubber substitute. The B. F. Goodrich Co., New York City, assignee of The Diamond Rubber Co., assignee of D. Spence and A. F. Clark—all of Akron, Ohio.

HOLLAND.

- *1,187. Coagulating latex and drying the resultant caoutchouc. Henderson & Korn, New York City.
- 1,139. Rubberizing textile materials. Lucien Liais.

*Denotes Patents for American Inventions.

ALBINITES.

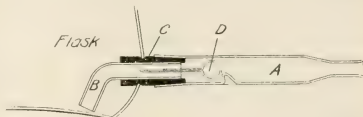
A new compounding ingredient known as Albinite white is being introduced in the French rubber industry. It is described as kaolinite, obtained chemically as a double decomposition product of extreme purity, whiteness, and of impalpable fineness. It is said to act as a vulcanization accelerator and is an inexpensive and satisfactory substitute for zinc oxide.

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

LABORATORY APPARATUS.

A CHECK VALVE FOR SUCTION FLASKS.

AN effective ball valve easily made and attached to the usual types of suction flasks has been devised by G. P. Walton, of the Bureau of Chemistry, U. S. Department of Agriculture. It consists of a glass tube *A* having an indentation or other check for the ball valve; a glass ball valve with guide *D* blown from a capillary tube; an inner glass tube *B*, and the valve seat *C*, a short piece of smooth, heavy rubber tubing with square cut ends. The parts are shown assembled and fitted to the usual form of suction flask. A rubber drain tube, not shown,

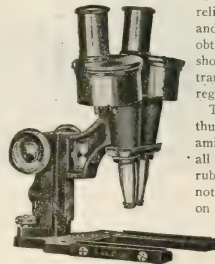


completes the apparatus. A comparatively slight suction is sufficient to close the valve perfectly, and upon releasing the suction a column of liquid in the flask a fraction of an inch above the valve is sufficient to start the outflow.

In the form of suction-flask not provided with an outlet at the bottom, a suitable vent may be drilled, by using a short section of copper tube in a drill press with carborundum and water for abrasive. To adjust the valve, force the rubber *C* through the vent, moisten the inner tube *B*, and push it through the rubber, making a tight joint between the latter and the wall of the flask; place the ball *D* in position, and force the outer tube *A* over the rubber. The rubber should project about 1/16 inch beyond the end of the inner glass tube, which serves merely as a siphon and brace for the valve-seat.

SPECIAL BINOCULAR MICROSCOPE.

A binocular microscope is particularly applicable to the work of an industrial laboratory, both for inspection and research. Through its double optical system the object is viewed with both eyes so that it is seen in relief, as with the unaided vision, and a distinct stereoscopic effect obtained. The image is also shown in its true form, and not transposed or inverted as with the regular microscope.



The binocular microscope is thus of special advantage in examining surfaces and materials of all sorts, as wood, metal, leather, rubber, fabrics, etc., and for noting the results of tool work on surfaces. A real perception of depth is obtained when viewing furrows, cracks, or like depressions.

The model illustrated has an extremely wide range of adjustments, permitting it to be conveniently used for every kind of work to which it may be put. For the examination of transparent or translucent materials, for counting threads in cloth or the like, the specimen is placed upon the stage and light directed through it by the mirror. When examining large surfaces, such as pieces of leather, rubber or paper, which are too large to be placed upon the stage, the upper part of the instrument may be detached and used with the stage as a base. This is the arrangement shown in the illustration.

The magnification obtainable with the outfits supplied with this instrument varies from 10 to 74 diameters. [Bausch & Lomb Optical Co., Rochester, New York.]

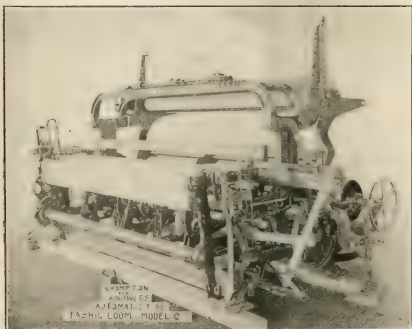
New Machines and Appliances.

AUTOMATIC TIRE FABRIC LOOM.

THE prominence that pneumatic tires have given to certain fabrics has resulted in many improvements in the looms on which building fabric is woven. The question of increased production has been fully considered in the design and construction of the loom shown in the illustration, which embodies the latest improvements in machines of this type.

These looms are generally equipped with automatic shuttle changers so that changing by hand is eliminated. The magazine carries six or seven shuttles filled with weft, and when the yarn on a bobbin is exhausted the shuttle is automatically thrown out and a new one substituted so that the loom continues to run without stopping as is necessary with the older types of looms.

There are various claims as to the percentage of production, but, broadly speaking, the average on each loom is from 80 to 90 per cent of a theoretical production of 100 per cent; moreover, the automatic loom is said to give better production and the cloth is woven more perfectly. This loom, therefore, is a decided improvement over the older type, where the filling or weft is changed by hand. Ordinarily, with the automatic loom, the amount of waste is less, referring particularly to the amount



of yarn left on the bobbins, because the automatic feeder can be set so that a very small amount is left. As the yarn used in tire fabrics is very expensive, the question of waste is a very essential matter to guard against.

The looms are made in various widths from 48 to 90 inches. As there has been some demand for long lengths of fabric during the past year, the looms are equipped with an attachment so that a roll of cloth 125, 250 and even 500 yards can be rolled up in the loom as woven. Most of the tire fabric is made from combed Sea Island or Egyptian yarn of the very best quality and weighs $17\frac{1}{4}$ to $17\frac{3}{4}$ ounces per square yard. The number of picks per inch is usually $23\frac{1}{4}$ to $23\frac{3}{4}$, and the fabric must be woven very carefully and free from knots.

The looms are particularly heavy and in a way similar to the duck loom, the widest weighing approximately three tons. The speed is usually from 128 to 100 picks a minute, according to the width; the wider the loom the slower the speed. They are driven by belt or by motor, and a great many of the newer mills are equipping with individual motor drive, which is a

desirable advantage. [Crompton & Knowles Loom Works, Worcester, Massachusetts.]

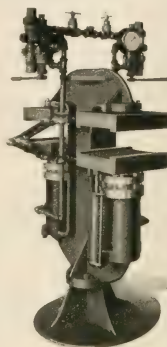
A NEW 15-TON DUPLEX VULCANIZING PRESS.

Increased production and economy in floor space are the special advantages claimed for the Duplex vulcanizing press shown in the accompanying illustration.

It is specially designed for tire manufacturers, to be used in patching slight defects in non-skid casing treads; however, it is readily adaptable to the manufacture of a variety of small mechanical rubber goods.

This press is built for 1,500 pounds accumulator pressure and develops 15 tons on each side. The rams are 5 inches in diameter with a $4\frac{1}{2}$ -inch stroke, and spring returns or "pull backs." The platens are 12 by 14 inches, with $4\frac{1}{2}$ -inch mold space and are connected by swing joints and chambered for steam. Plain flat platens can be furnished if desired. Each side of the press is operated independently and controlled by patented single pressure quick operating valves.

The weight of the machine is 1,450 pounds and it occupies a floor space of 36 by 34 inches. Height over all is 6 feet 7 inches and height of the platen from the floor is 3 feet. [Metalwood Manufacturing Co., Detroit, Michigan.]

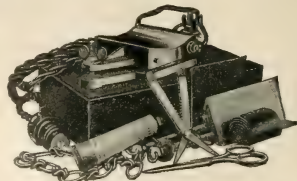


PREMIER ELECTRIC VULCANIZER.

Tire repairing on the road, or, for that matter, in the garage, is exceedingly simple, safe and sure, according to the claims made for the Premier electric car repair vulcanizer. This handy little device can be used in making repairs on casings and inner tubes with ease and facility. Attach the wires to the storage batteries

or a 110-volt lighting circuit and after preparing the tube or casing, clamp on the device and press the red button shown in the illustration on the side of the vulcanizer. When the vulcanizer develops sufficient heat to cure the repair, an automatic temperature control instantly shuts off the current.

The apparatus weighs but two pounds, and the standard equipment includes a tool for holding open the cut when preparing a casing, scissors for cutting the Para rubber gum, a tube of quick curing cement, a piece of emery cloth for cleaning and roughening the rubber, and wax papers to place over the repair to prevent the vulcanizer from sticking. The vulcanizer is fitted with a connecting cord and a durable chain for clamping to the work, the whole outfit being packed in a neat container. [Premier Electric Co., Chicago, Illinois.]



MACHINE FOR ENGRAVING NON-SKID TIRE MOLDS.

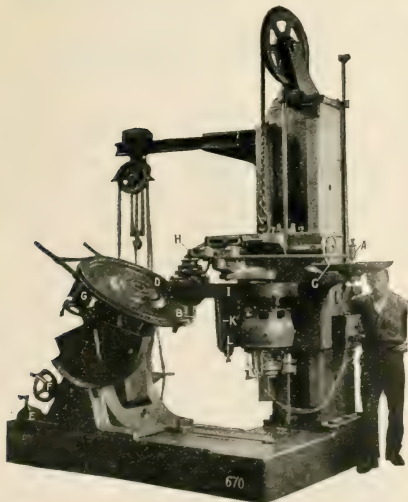
The universal engraving machine illustrated and briefly described here, was designed for the purpose of engraving non-skid molds used in the manufacture of pneumatic tires of all descriptions.

It works on the familiar pantograph principle, where a tracing pin at one end of the pantograph is guided over a carefully



prepared copy of the design which it is desired to reproduce, and the engraving tool at the opposite end of the pantograph accurately cuts this design in the tire mold.

A is the tracing pin and *B* the engraving tool. The copy to



be followed is fastened to the holder plate *C*, while the mold to be engraved is clamped to the index plate *D*, which can be adjusted to any angle by the hand wheel *F*. The handle *E* provides

for adjusting the position of the work holder. The drum *G* is provided for moving the work through fractional parts of a revolution. The "copy" guides the engraving tool in a horizontal plane, but owing to the fact that the mold is concave, a template *H* is provided to control the vertical movement of the engraving tool.

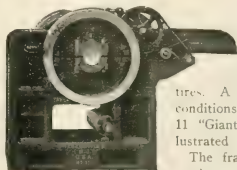
The vertical cutter spindle is mounted in the frame *I*, to which the motor spindle drive is also attached. The motor and spindle mechanism are supported on the link *K*, which in turn is carried by the pivot *L*, and a similar pivot on the column slide. These pantograph pivots are fitted with radial and thrust ball bearings, so that the movement is very sensitive.

All types of molds, for all sizes of tires up to 48 inches in diameter, can be engraved on this machine. Concerning the rate of production, a letter *S*, 1½ inches high, was engraved in a forged steel ring to a depth of 5/16 inches in four minutes. The same letter was engraved in cast iron in 1½ minutes. The dimensions of the machine are as follows: Height 12 feet, floor space 5 by 9 feet, net weight 18,000 pounds. [George Gorton Machine Co., Racine, Wisconsin.]

THE "GIANT" RUBBER SCRAP CUTTER.

The increased use of motor trucks within the last few years has naturally thrown a great many old tires on the rubber scrap market, which has brought up new problems as to the

best way of getting them into shape for reclaiming. A very heavy, strong machine is of necessity required for cutting these large solid tires. A cutter built to meet these conditions is the Taylor-Stiles No. 11 "Giant" rubber scrap cutter, illustrated here.



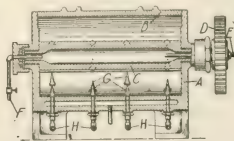
The frame is made of one solid casting weighing over 2,800 pounds. The head, or revolving knife cylinder, is steel, 20 inches in diameter, weighing about 1,100 pounds, and is practically unbreakable. The main shaft is 6-inch hammered steel, with bearings 11 3/16 by 5½ inches. It is equipped with two 24 by 8½-inch special balance shearing pulleys, one on each side, which gives a nearly perfect balance and enables the cutter to be driven either right or left hand. The shearing feature of these pulleys prevents the possibility of any serious damage due to running iron or any foreign matter into the machine.

After the tire has been cut once, it is fed endways into the feed box and passing under the spiked feed roll, it is cut off in slices from ¼-inch to ½-inch thick by the three 17-inch revolving knives cutting against the bed knife, leaving the material in good shape for further treatment. This machine will handle equally well pneumatic tires, hose or any other rubber scrap. [Taylor, Stiles & Co., Riegelsville, New Jersey.]

MACHINERY PATENTS.

PRICE'S VACUUM MASTICATOR.

WHEN rubber stock is prepared previous to vulcanization it is very important that the material should be free from entrapped gases or liquids. This object is accomplished by the novel application of a vacuum in connection with a machine commonly known as a masticator.



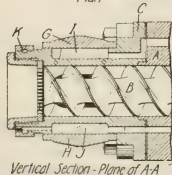
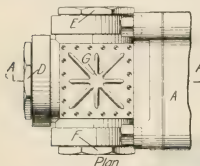
In the illustration, which shows a side elevation in section, *A* is the cylindrical casing jacketed for heating and cooling, provided with a hinged cover *B*. The corrugated

roll *C* is hollow and connected to pipes *E* and *F* through which the heating or cooling medium is conducted. It revolves in bearings supported in the ends of the casing and is driven by a spur gear *D*. A multiplicity of hollow pins *G* extend within the casing and are connected to the vacuum pipes *H*.

As the roll rotates, the rubber stock will be kneaded between the corrugated roll and the inner sides of the casing; meanwhile the hollow pins will penetrate the mass and the gases and fluids withdrawn from the material by action of the vacuum. [Raymond B. Price, New York City, assignor to Rubber Regenerating Co., a corporation of Indiana. United States patent No. 1,184,016.]

ROYLE'S TUBING MACHINE HEAD.

Tubing machines are at times subjected to excessive strain due to overcrowding the capacity for which the machine is designed. Royle's invention precludes this danger, whether the machine is used for multiple tube forming or straining reclaimed rubber, by providing a plurality of discharge openings in the head.

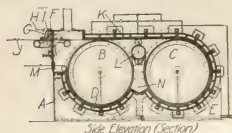


The annular chamber *K* surrounds the front discharge opening for the same purpose.

The construction of the head permits the stock worm to be used at full capacity without danger of overcrowding, since the material will find an outlet through the lateral passages when the forward discharge passage is overloaded. [Vernon Royle, Paterson, New Jersey. United States patent No. 1,182,711.]

HOPEWELL'S ENCLOSED SPREADER.

This machine proofs and dries the fabric within an enclosed chamber from which the volatile vapors are conveyed to a separate apparatus where the solvent is recovered. The plates designated by *A* in the illustration enclose the revolving steam-heated cylinders *B* and *C*. Supplemental heat is furnished by the sectional steam plates *D*, *E* and *K*.



The spreading mechanism is bolted to the frame at *F* and comprises a transverse chamber in which a scraper travels back and forth automatically, cleaning the back of the hinged spreading knife *G* that is raised by hand levers *H*. The chamber *I* is provided with a fabric slot opening into the dryer and extending the entire width of the machine.

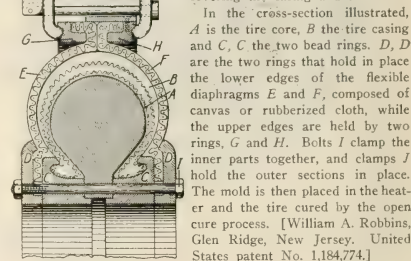
A metal fabric supporting strip closes the bottom of this chamber and passes around a transverse roller that is raised or lowered to adjust the distance between the fabric and spreading knife.

The dough is spread on the fabric *J* in front of the knife and seals the opening through which the web passes into the vaporiz-

ing chamber. Revolving knives remove foreign particles and imperfections and the coated and cleaned fabric passes around heated drum *C*, over water-cooled roller *L* and around drum *B*, passing out through opening *M*, sealed by felt-covered rollers. The volatile vapors are conveyed to a brine-cooled solvent condenser of the usual coil type where the solvent is recovered. [Charles F. Hopewell, Newton, Massachusetts. United States patent No. 1,184,452.]

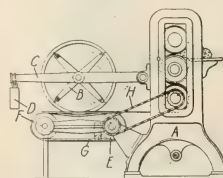
A NEW OPEN CURE TIRE MOLD.

The principal object of this invention is to avoid the wrapping process customary in open cure tire vulcanizing. In place of the usual strips of cotton cloth that are wound around the mold and tire, a fabric diaphragm is clamped securely on both sides of the tire, forming a flexible support, covering the casing and tread.



APPLYING HARD COMPOUND TO SOLID TIRE RIMS.

This machine receives the hard rubber compound from a strip forming calender and lays it evenly on the metal base or rim, forcing it into the grooves provided for anchoring purposes.



carry a wire belt or a series of wire belts *G*, driven by sprocket gearing and chain *H* from the calender.

The rim is then placed upon the machine feeding the compound to be used for the base of the tire and put in operation. The strip of compound passes between the rolls and upon the traveling belt which rolls it upon the rim while still warm and tacky, causing the latter to revolve through frictional contact. When the rubber on the rim is of sufficient thickness, it is removed and placed upon the second machine, which applies the compound for forming the outer part of the tire. In making tires according to this invention, a number of calendering machines are provided, having attached thereto the apparatus described, one complete machine being provided for each of the different compounds to be incorporated in the tire. After enough of this has been rolled upon the rim, the rim and tire are placed in a mold and vulcanized by heat and pressure. [John J. Gammer and Walter H. Allen, Akron, Ohio, assignors to The B. F. Goodrich Co., New York City. United States patent No. 1,183,552.]

A CORD TIRE. Endless loops of rubber-impregnated strands are twisted, forming cords with loops at each end which are laid over the core and held by the bead wires which pass through the loops of the cords. [George F. Fisher, Plainfield, New Jersey, assignor to Morgan & Wright, Detroit, Michigan; United States patent No. 1,183,965.]

BEAD WIRE FORMING MACHINE. A number of wire strands can be wound on a form wheel by setting a stop bracket at a point indicated on the scale. When the indicated number of revolutions has been wound on the form wheel the machine stops automatically. [F. C. Brucker, Akron, Ohio, assignor to Miller Rubber Co., Akron, Ohio; United States patent No. 1,184,619.]

CALIPER GAGES FOR RUBBERIZED FABRICS. Two ordinary gages are mounted above a tension roller over which the rubberized fabric passes, the thickness being continuously indicated by the gages. [Thomas Midgley, Worthington, Ohio, assignor to Morgan & Wright, Detroit, Michigan; United States patent No. 1,184,002.]

TIRE BUILDING MACHINE. A plurality of stock rolls for frictioned fabric of different widths are mounted on a reel. The fabric is fed to the core by feed rollers that stretch the fabric. The feed rollers are driven by a friction wheel that contacts with the core and regulates the stretch of the different fabric plies as they are applied to the core. [William W. McMahan, assignor to Morgan & Wright, both of Detroit, Michigan; United States patent No. 1,183,996.]

British Patents.

SEIBERLING'S FRICTION CALENDERS.

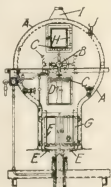
This patent relates to continuously-working apparatus for coating both sides of the fabric with rubber and for applying a skim coating to one of the sides. The fabric to be coated is placed in two stacks *A, B*, with a railway sewing-machine *C* interposed for joining the end of *B* to the beginning of *A*. The fabric *D* is drawn from the top of *B* and passes through a tensioning device *E* over idler rolls 35, 36, 41 to a calendar

F, where the under side receives a coating of rubber. The fabric then passes through a tensioning device *G* to a second calendar *H*, which coats the upper surface, and thence to a tensioning device *I* having cooling rollers 53, 56. The fabric next passes to a device *J* wherein the selvage edges are trimmed off and a third calendar *K* applies a skim coating to the upper surface of the fabric, which finally is wound up by a device *L*. [F. A. Seiberling, Akron, Ohio. British patent No. 1,289 (1915).]

A NEW DIPPING MACHINE.

The cylindrical casing *A* is shown in end elevation and contains a central shaft *B* having radial arms supporting at their outer ends four carriers *C* for the dipping forms *D*. The lower part of the casing forms a chamber *E* located over a hydraulic ram, upon which is wheeled a solution tank *F* through the doors *G*. The forms are introduced through a door *H*.

The shaft being locked, with one set of forms arranged vertically over the tank, pressure is applied to the ram and the tank is raised until the forms are immersed in the solution, then a trip lever shuts off the pressure and opens the exhaust which lowers the tank.



When this is clear of the forms, the shaft is unlocked and turned by means of the hand wheel to bring down the next set of forms, and the operation is repeated. The tank has hinged lids that open and close as it is raised or lowered. The vapors escape through the pipe *I* and a steam coil *J* is provided for drying the dipped forms. [J. W. Reeves, 25 Great Poultny street, London, England. British patent No. 1,344 (1915).]

DRIVING BELT FOR MOTOR CYCLES. Two ridges extend continuously around the outer surface of the belt. In another type transverse ridges forming troughs are used, the idea in both instances being to carry off any water that would cause the belt to slip. [Dunlop Rubber Co., Limited, London; British patent No. 4,692 (1915).]

GAS HEATED VULCANIZING PRESS. The platens are heated by gas burners in combination with means for automatically maintaining the platens at a predetermined temperature. [I. Hall, Whitehouse street, Aston, Birmingham, England; British patent No. 1,063 (1915).]

OTHER MACHINERY PATENTS.

THE UNITED STATES.

- 1,183,121. Core for resilient wheel tires. F. V. Roedel and C. H. Franks, Akron, Ohio.
- 1,183,907. Apparatus for making cores for resilient wheel tires. F. V. Roedel and C. H. Franks, Akron, Ohio.
- 1,184,034. Testing machine. H. L. Scott, Providence, R. I.
- 1,184,949. Heater for dental vulcanizers. U. A. Twynn, St. Louis, Mo.
- 1,184,988. Tire mold. H. S. Patton, Alameda, Calif.
- 1,184,990. Means for effecting the union of layers having adhesive surfaces. J. E. Perrault, Belmont, assignor to Hood Rubber Co., Water-town—both in Massachusetts.
- 1,186,374. Plating machine. F. F. Brucker, assignor to Miller Rubber Co., both of Akron, Ohio.
- 1,186,591. Machine for the mechanical production of the covers for pneumatic tires. A. Mathern, Zellikon, near Zurich, Switzerland.
- 1,187,339. Tire head forming apparatus. C. Kuentzel, assignor to The Republic Rubber Co.—both of Youngstown, Ohio.
- 1,187,436. Portable repair vulcanizer. A. B. Low, Denver, Colo.

THE DOMINION OF CANADA.

- 168,025. Tread ring for vehicle tire molds. F. McRae Bowden, Toronto, Ontario, Canada.

THE UNITED KINGDOM.

- 978 (1915). Vulcanizing india rubber. J. H. Nuttall and D. Bridge & Co., Castleton Iron Works, Castleton, Lancashire.
- 1,058 (1915). Molding plastic materials. A. Bartels, 102 Buxtehuderstrasse, Harburg on the Elbe, Germany.
- 1,143 (1915). Pulley provided with a surface wrapping consisting of layers of rubber coated cloth. Baraness A. Bude, Rue de l'Arrivée, Enghien, near Paris.
- *100,309 (1916). Tire building machine. Goodyear Tire and Rubber Co., 1144 East Market street, Akron, Ohio.
- *100,397 (1916). Manufacture of pneumatic tires. A. H. Harris, Youngstown, Ohio.

*Denotes Patent for American Inventors.

PROCESS PATENTS.

MAKING SOLID TIRES. A process for making solid tires having bases of harder vulcanizing compound than the tread, consists in forming strips of compound of uniform thickness and applying them to the rim. [John R. Gammeter and Walter H. Allen, Akron, Ohio, assignors to The B. F. Goodrich Co., New York City; United States patent No. 1,183,551.]

METHOD OF MAKING TIRE CASINGS. The middle portion of the fabric is stretched to a greater degree than the edges and then shaped by cupping and applied while curved to the core. [John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City; United States patent No. 1,183,553.]

REMOVING FLUIDS FROM RECLAIMED RUBBER. The rubber stock is penetrated by a multiplicity of hollow points through which gases or liquids are extracted and the mass subjected to pressure. [Raymond B. Price, New York City, assignor to Rubber Regenerating Co., Mishawaka, Indiana; United States patent No. 1,184,259.]

INSULATING TELEPHONE CABLES. In a telephone cable with

artificially increased induction load and wherein the conductor is insulated with gutta percha or similar material, the dielectric losses are minimized by eliminating or reducing the resinous substances. "Green" gutta percha which contains a small amount of resin may be used alone or may be mixed with gutta percha or balata to reduce the proportion of resin. Artificial gutta percha or *Gutta Gutzsch*, prepared according to Specification 15,255 (1899), may also be mixed with gutta percha or used alone. The insulating material may be arranged in several layers, and one or more of the substances, such as resin-freed balata, green gutta percha, *Gutta Gutzsch*, and gutta percha mixtures, may be used in some or all of the layers.

[K. W. Wagner, 1 Luisenenstrasse, Lankwitz, Berlin, Germany. British patent No. 1,346 (1915).]

OTHER PROCESS PATENTS.

THE UNITED STATES.

- 1,143,022. Method of making vulcanized rubber. C. D. Mason, Naugatuck, Conn., assignor to The Goodyear's Metallic Rubber Shoe Co., a corporation of Connecticut.
- 1,183,023. Vulcanized rubber article. C. D. Mason, Naugatuck, Conn., assignor to The Goodyear's Metallic Rubber Shoe Co., a corporation of Connecticut.
- 1,183,551. Process of making tires. J. R. Gammeter and W. H. Allen, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.
- 1,183,553. Method of making tires. J. R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.
- 1,184,259. Process for treating plastic material. R. B. Frice, New York City, assignor to Rubber Regenerating Co., Mishawaka, Ind.
- 1,184,035. Process of testing textiles. H. L. Scott, Providence, R. I.
- 1,184,328. Method of making cord tires. M. A. Dees, assignor to American Tire Co.—both of St. Louis, Mo.
- 1,185,654. Method of producing synthetic caoutchouc. E. Gottschalk, Newark, N. J., M. G. Titus and S. R. Monroe, executors of said E. Gottschalk, deceased.

THE UNITED KINGDOM.

- 692 (1915). Method of manufacturing rubber balls. A. Schnek, 32 Rotheisgasse, Vienna.

THE DOMINION OF CANADA.

- *168,121. Method of manufacturing tires. Morgan & Wright, assignee of E. E. A. G. Meyer and G. W. Seiberling—all of Detroit, Mich.
- *168,275. Process of eliminating porosity from a rubber bottom for a rubber shoe. The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, Canada, assignee of W. E. Piper, Melrose, Mass.

RUBBER CALENDER CONTROLLERS.

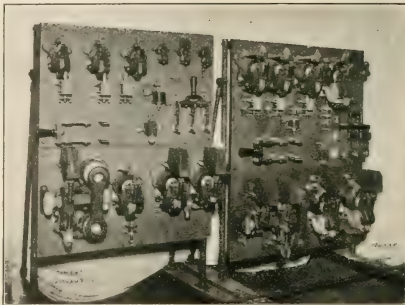
THE application of electrical apparatus to rubber calender drives, in practically all cases, requires motors with 4 to 1 speed variation and suitable controllers. The speed limit of the motors should be approximately 1,000 revolutions per minute. To meet these requirements the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, has developed a line of motors and controllers for rubber calender drives, designed for operation on two voltages—115 and 230 volts direct current. This method has been adopted, due to the fact that electrical equipment for calenders can be made somewhat cheaper if used on a two-voltage circuit rather than a single-voltage circuit, and there is very little difference between the cost of providing either a two-wire or a three-wire circuit. As a matter of fact, in practically all large rubber plants two-voltage, direct-current circuits are used to secure power for the calenders.

As a rubber calender represents a constant torque application, a motor of sufficient capacity to provide the required torque at high speed will take care of the power requirements throughout the whole speed range. The motors furnished for calender drives have a two to one speed range by field control.

The controllers furnished provide approximately a 6 to 1 speed variation by means of armature and shunt field control on the two-voltage circuit. They also have a "threading in"

point which gives a speed of approximately 50 per cent of normal low running speed by means of armature control. This threading in point is used when starting up the calender after it has been stopped. Acceleration is automatic up to the setting of the master switch handle, and is controlled by shunt contactors with mechanically interlocked accelerating relays, and by field accelerating relays. Emergency stop with dynamic braking is obtained by a slack cable switch, which can be operated by rope, or by another suitable means, and must be reset by hand. The design of these controllers is such that there is no slump in speed when decelerating from 230 to 115 volts. The operation and features of the controllers in brief are as follows:

Starting and speed acceleration is obtained by a drum type master switch. A starting push button is also furnished, by means of which the calender can be started and automatically



accelerated to speed corresponding to the setting of the master switch. One of the line contactors is provided with a back contact, which gives dynamic braking on the motor when the calender is shut down, either by means of the slack cable switch or the master controller. This assures stopping of the calender quickly. A two-pole, double-throw knife switch is also provided to permit quick reversing of the calender. The controllers, however, are not designed, nor are they required to operate in the reverse direction. Overload and no-voltage protection is provided.

The controller shown on the left in the illustration is one for use with motors varying from 75 to 150 horse-power in capacity. The line and transfer contactors shown on the bottom panel are of 500-ampere capacity. The accelerating contactors shown on the upper portion of the panel have a capacity of 250 amperes. The panel on the right is for use with motors having a capacity of 125 horse-power and upwards. The main line contactors and transfer contactors have a capacity of 1,250 amperes, and the accelerating contactors are of 500-ampere capacity.

ARTIFICIAL DAYLIGHT LAMP FOR COLOR WORK.

Rubber chemists engaged in preparing and matching colored rubber stocks will appreciate the Scimatco lamp.

The annoyance and loss frequently sustained by insufficient or improper illumination, or by delays spent in waiting for sunlight, have been looked upon as necessary evils. The Scimatco artificial daylight lamp has removed completely the risk of these losses and made it possible to ignore the weather and the hour in making color comparisons because the light produced is spectroscopically identical with daylight. [Scientific Materials Co., Pittsburgh, Pennsylvania.]

*Denotes patents for American inventions.

The Editor's Book Table.

THE FINANCIER RUBBER SHARE HANDBOOK. Thirteenth Edition. April, 1916. The Financier & Bullionist, Limited, London, England. [Cloth, 8vo, 860 pages. Price, 3s. net.]

THIS convenient handbook has a wealth of information regarding the many stock companies owning rubber plantations in the Far East, South America, Africa, and other rubber producing countries. It gives the authorized share capital of each of these companies, the amount issued, the balance sheet, the list of directors, acreage and similar information, well arranged and quickly available. Besides this an alphabetical list of directors in all these companies is given, including a list of secretarial groups in London, with the addresses and telephone numbers. In the preface is given the world's production of rubber in 1915, and it may be well to print in this connection, for comparison, the production of previous years, as given in the 12th edition of this handbook. The figures are as follows:

	Plantation.	Brazil.	Rest.	Total.	Increase, Per Cent.
1915.....	106,989	37,220	12,615	157,824	31.0
1914.....	71,380	37,000	12,000	120,380	11.0
1913.....	47,618	39,370	21,452	108,440	9.6

In the thirteenth edition Mr. Killick, rubber expert of the "Financier," gives as the probable total output for the year 1916, about 200,000 tons. He says that a low price for the commodity tends to restrict production, more especially of wild rubber, which is far more expensive to collect than plantation. However, he considers that the present price standard leaves a sufficient margin of profit for the Brazilian industry to continue as before.

Speaking of the maturity yield of rubber per acre, it is considered that 400 pounds an acre is about the proper figure on which to base calculations, though estates are mentioned whose yield was far higher, in one case, the Seafeld Estate in Selangor, yielding 682 pounds per acre from 124 acres planted in 1904, and from the entire area in tapping (1,940 acres) an average of 439 pounds.

Regarding investments, Mr. Killick believes that the share market value of estates of the Pataling type may be quite common in years to come, from the fact that an acre of *Hevea* yielding 400 pounds of rubber at 1s. a pound profit per year is worth £200 capital.

INDIA RUBBER AND BALATA BELTING AS CONVEYOR AND Power Transmission Belts. An address by James Tinto before the Manchester Association of Engineers. [Pamphlet, 16 pages.]

Mr. Tinto, of the Irwell & Eastern Rubber Co., Limited, Manchester, England, in this address gives some account of the introduction and history of rubber belting. He describes minutely the manufacture and tests for transmission and conveyor belts. Of the latter, he mentions some of the largest or longest in use, going into details and figures. He quotes from a friend in America, that the rubber belting trade totalled \$18,000,000 in 1914 and \$26,000,000 in 1915. He mentions the many industries where conveyor belts are used, and gives particulars of such use in the New York Post Office Station at the Grand Central Station, described in THE INDIA RUBBER WORLD, September 1, 1915.

For the introduction of balata belting, he credits R. & J. Dick, of Glasgow, who made this in 1884, and in 1885 secured a patent. For balata belting he claims the following qualities: Freedom from shrinkage, resistance to stretch, great tractive power, solidity of texture, great durability, absolute uniformity throughout, unequalled transmitting ability, perfect balance and flexibility, steam and water proof.

A weakness of balata belting, he states, is its inability to

stand heat. It should not be exposed to a temperature of more than 100 degrees F. Neither should it be used where it is liable to come in contact with oils, particularly mineral oils. He states that balata belts have been proven superior to any other for electric lighting of trains, the power being driven from the axle under the body of the coach. Such belts are exposed to varying speeds, and all kinds of weather and subjected to unusual abrasive wear.

The pamphlet is illustrated with half-tones of a number of unusually large belts made by the corporation with which Mr. Tinto is connected.

LARGE SINGLE VERSUS DUAL SOLID TIRES FOR REAR TRUCK Wheels. By W. H. Allen, manager Truck Tire Department, The B. F. Goodrich Co., Akron, Ohio.

In a paper presented at the semi-annual meeting of the Society of Automobile Engineers, Mr. Allen announces his opinion in favor of the use of large single wheel rear truck tires instead of smaller dual tires. He maintains that dual tires are overrated and that the statement that dual equipment is capable of carrying loads double that of one of the singles of the pair, is open to discussion. His reasons for advocating large single in place of small dual equipment are that the contact area of the former exceeds that of the dual it replaces. The load per square inch is distributed over a reduced contact area. Small dual equipment does not give satisfactory performance, for the reason that neither single tire is sturdy enough under certain conditions. Also, with the single tire equipment, costs are reduced from 8 to 15 per cent. Wheel cost is less because of the narrower felly and wheel rim, saving in wheel, tire and rim weight. Other advantages are, easier fitting of non-skid chains, better tracage with front wheels, greater height of rubber tread, providing better cushioning properties and increasing tire life, and less strain on the axle and wheel bearings. Mr. Allen states, however, that the large single tire has its limitations, and pending results of further investigation, he deems it advisable to consider 7-inch tires as the limit of practical single equipment.

PREPARING PLANTATION RUBBER FOR THE MARKET. Annales des Planteurs de Caoutchouc de l'Indo-Chine No. 49. Saigon, Cochinchina.

The report of a recent meeting of the Rubber Planters' Association of French Indo-China gives in detail the discussion on methods of preparing crude rubber for the market. Naturally, opinions differed. A member who had just returned from inspection of plantations in Java claimed that *crêpe* offered advantages of rapid preparation and enabled planters to ship the crude rubber within a week of collecting the latex.

Honorary President Le Croispieller is of the opinion that *crêping* destroys the "nerve" of the rubber. Manufacturers prefer sheets to *crêpe*, but it is immaterial whether the sheet be smoked or not. As practiced, the smoke is not incorporated with the rubber, but is merely a surface deposit, and gives no added value, unless as an outside protection against mold. Smoked sheet must be washed more than *crêpe*. The premium on smoked sheet has rapidly dwindled.

Attention was called to Perrot's book on the London Rubber Show of 1914, in which the block process was described. President Croispieller stated that he considered Perrot a theorist, having little practical knowledge on the subject. Regarding block rubber, however, it was said that Michelin, the tire manufacturer, gave minute directions for preparing the rubber as he

preferred it. These were: First, no coagulation by acid, and no machinery. There should be a pure and simple desiccation of fresh latex, poured into pans to a depth of $1\frac{1}{2}$ to 3 inches, placed in a well-ventilated place, protected from sun and dust, for several days. The film of rubber should be removed and, if necessary, dried between blotting paper, and it is then ready to ship.

Dr. Versin, who sells large amounts of rubber to Michelin at highest quoted prices for first latex crêpe on the day of delivery, was said to have written that his method was simply preparation by natural coagulation, moderate washing between fluted rolls, drying eight days and compressing into blocks for packing. It was stated by M. Cremazy that Michelin had said he did not know how to vulcanize all the kinds of rubber he received, and that he had experienced so much trouble from this source, that he contemplated going into the planting business to raise and prepare all he required.

The conclusion was, that manufacturers' ideas were so divergent, and their manipulations so different, that it would be impolitic for all planters to unite upon any one process for preparing rubber for the market.

NEW TRADE PUBLICATIONS.

A NEAT little booklet entitled "The Mill by Stony Brook" gives a brief outline of the history of india rubber, and the establishment and growth of the Boston Belting Co. Pictures are shown of the original factory, and of the seven principal buildings of the present plant, and also miniature reproductions are printed of various diplomas and awards received by the company for its belting.

The bicycle is coming back into popularity, perhaps not to the extent of pre-automobile days, but manufacturers are finding a good sale for the modern up-to-date bicycle. The Fisk Rubber Co., Chicopee Falls, Massachusetts, has published a neat booklet entitled "How to Form a Fisk Club," which is intended to interest boys and girls in bicycling and, indirectly, to help the sale of Fisk bicycle tires. The book, which is pocket size, gives information on how to organize a club, a list of officers to be chosen, signals for the road, by-laws and parliamentary rules for procedure of business meetings; also instructions in signal flag drills and suggestions for club runs. The company is careful to note that it is not intended that boys who are not using Fisk tires should be barred from membership in Fisk clubs, but that any boys should be allowed to join who wish to do so. The company has made an offer of a free set of fancy colored non-skid bicycle tires to the secretary of each of 100 best Fisk clubs. A full description and a price list of the Fisk tires is given at the end of the pamphlet, and a bird's-eye view of the company's plant is shown on the back cover.

Harrison Brothers & Co., Inc., Philadelphia, Pennsylvania, are sending out a little publication entitled "Our Battle with the Iron-Eaters," which is made up principally of fac-similes of testimonials from many leading manufacturing concerns praising "Antoxide" which, as its name indicates, is a preparation for the prevention of rust on metals. Very little is printed except these letters, which are sufficiently strong in themselves to form a good advertisement for the preparation. The first page has a fac-simile of a rust-eaten iron plate which is oxidized to the extent that a portion has been entirely consumed. The whole is bound with a red silk cord.

The B. F. Goodrich Co., Akron, Ohio, is sending out to the trade a handsome lithographed hanger, a reproduction of a painting begun by the late A. B. Frost, one of the last works of the famous artist, left unfinished, and later taken up and finished by

his son, John Frost. It represents the main street in a country town, where the constable has held up a dapper feminine motorcyclist for speeding. The expressions on the faces tell the entire story, in Mr. Frost's best style. The hanger is entirely without advertisements, with the exception of the Goodrich sign in the village store in the background. Undoubtedly this hanger will find a prominent place in many offices and rubber stores.

W. T. Henley's Telegraph Works Co., Limited, London, England, is sending out some attractive and informative booklets, descriptive of the tires of its manufacture. Two booklets are of the catalog class, picturing, pricing and describing, one the solid band tires, and the other the pneumatic tires, which are denominated "All-British," with a parenthetical clause "made in England by British Labour." A third pamphlet treats of the "Cause and Prevention of Abnormal Wear of Solid Tyres," and the fourth, "Science and Tyres," gives a description of the processes of manufacture, illustrated by a number of small but clear half-tones of the various machines, mills, presses, vulcanizers, etc. This latter booklet also gives some directions for the care of tires, and descriptions of tubes and treads of the Henley make.

The Britton Manufacturing Co., Brookings, South Dakota, sends out a very finely printed pamphlet describing its tire and giving facts regarding the same. The cover of the book has a fine half-tone engraving of an automobile wheel with a steel-studded, leather-covered tire, each stud being printed in gold and embossed in high relief. The catalog is one which would receive more than a passing glance because of its attractiveness.

POSTERS ADVOCATING PREPAREDNESS.

The Rubber Club of America, Inc., is certainly doing its share in the national preparedness campaign. About the middle of last month the committee on preparedness sent out to every rubber manufacturer a set of seven posters which had been prepared by the Patriotic Education Society and the National Security League. Most of these posters are nearly two feet by three feet. Two of a smaller size, however, are fully as noticeable, because they are printed in the national colors. All of these preach preparedness and are intended to be posted in offices and factories to promulgate the views of this society and league. Each poster takes up some one vital phase of the issue and points out the urgency with which Congress should adopt the recommendations of military and naval experts. The Rubber Club is also distributing a convincing and readable book on "Peace Insurance" by Richard Stockton, Jr., the purpose of which is sufficiently indicated by its name. The preparedness committee of the Rubber Club is to be commended for the energy with which it is entering upon the duties assigned it.

MILL-PANTS AND RUBBER BOOTS.



A thoroughly efficient clothes protector for work in mills, rubber factories and garages is afforded by the mill-pants and rubber boots here illustrated. The pants are made of heavy cotton material, rubberized. They are supported by shoulder straps and fit closely over stout rubber boots, which are made according to the specifications of the individual customer. This outfit is also well adapted for fishing and wading, or any occupation which necessitates protective covering from water or greasy substances. A similar garment is made entirely of rubberized material, to be worn over the wearer's trousers and shoes. [Alfred Hale Rubber Co., Boston Massachusetts.]

New Goods and Specialties

THE "NATURAL NURSER" NIPPLE.

THIS "Natural Nurser" outfit consists of a wide-mouthed glass cell and a rubber nipple and is claimed to afford the closest duplicate of natural nursing in existence. One of the greatest troubles in artificial nursing is the tendency of nipples to cave in, or collapse, so that the infant cannot obtain its food properly. As the food comes out, air must enter, and when it does not, owing to the fact that the only outlet is inside the baby's mouth, a vacuum is formed inside the bottle and the nipple, being of flexible construction, collapses.

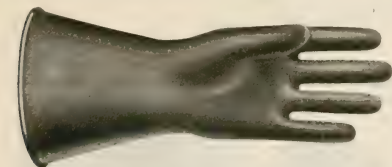


The special valve in the rubber nipple here illustrated is designed to eliminate this difficulty. Its action is automatic. On the inside of the nipple is a circular raised part across which a slit is cut, a pin hole on the outside running through into this slit. In use, as soon as a vacuum begins to form inside the bottle, the air pressure will cause the nipple to give at the part where there is least resistance, but as the valve is surrounded by a circle of thinner rubber than the rest of the nipple, it gives at the valve, opening the slit enough to admit air. This ends the vacuum inside the nipple, which immediately returns to its proper shape. It is claimed that owing to its ingenious patented construction, the valve will not leak.

Two horizontal and three vertical ribs are molded on the inside of the nipple, giving strength and resistance against distortion and acting as springs to keep the nipple in shape. The heavy flange at its base fits over the raised edge or beading on the bottle, holding the nipple tightly in position. [The Faultless Rubber Co., Ashland, Ohio.]

THE AETNA ELECTRICIAN'S GLOVE.

The hazard of the live wire renders a lineman's life one of constant danger, and the greatest precaution is necessary for safety. An improvement in the protective hand covering worn by electricians is offered in the rubber glove here illustrated. These gloves possess high dielectric qualities. The Electrical Testing Laboratories of New York City show in their report



that 10,000 volt Aetna gloves withstood 32,000 volts before breaking down, and the 5,000 volt gloves withstood 19,200 volts. They are made of tough rubber that will withstand hard usage on poles, wire, etc., and it is claimed that leakage, the common trouble in linemen's gloves, is practically eliminated. A special feature is the wide wrist, which allows the glove to be drawn over a heavy coat sleeve in winter. They are made in maroon and black rubber, in 12, 14 and 18 inch lengths and in the usual hand sizes. [The Aetna Rubber Co., Cleveland, Ohio.]

FASHIONS IN BATHING COSTUMES.

The entire costume shown in the first illustration, with the exception of the pure rubber cap, is made of rubberized mummy silk. The wistaria-colored bathing suit is cut in Mandarin style and trimmed with contrasting bands in exquisite shades of American beauty, blue and green. The cap worn with this costume is plaited and built over wire. The bag carried on the arm is intended to hold the bathing suit when not in use. It has a stiffened bottom and fastens at the top with a cord, two wooden strips securely clamping the edges together when closed. The pointed oval cushion has the same design as the bag.



and an Oriental parasol completes a seashore costume of marked originality and beauty.

The rubber coat shown on the second figure, is of pale blue, with revers and frogged fastenings. It has no sleeves, the front being slashed all the way across for the arms, the two lower pieces fastening by means of loops on a button underneath the center of the top part. This lower section may be left unfastened, if desired, swinging free at the sides and giving the effect of a cape. The wired, fringed edges of the rubber hat worn with this coat give a saucy, wing-like effect that is wholly captivating. [L. C. Studios, New York City.]

THE "TEXTAN" SOLE.

"Textan" is the name given to a new material to be used in place of leather for the soles of shoes. While this is a secret composition, it is evidently one of that class composed of fibrous substance with a binder of vulcanized material. Long wear is claimed for this new sole, and other advantages claimed are that it gives a handsome finish to the shoe; that it can be sewn through by machine without cracking; that the sole will not

crack across the ball, and that it is light in weight and waterproof. [The B. F. Goodrich Co., Akron, Ohio.]

NEW USES FOR THE VACUUM CUP.

Automobile driving is hard on the eyes, the watchful gaze of the driver being affected by snow-blinding in winter, the dazzling heat of summer, and the reflecting light cast from wet roads. At night, also, the glare of headlights on approaching cars impairs the vision. By means of the device here illustrated, the optic nerve which contracts the eye under strong light is protected from all glare and allowed to relax, thus eliminating a prevalent and serious difficulty. A flexible circular disk of deep orange color is attached to the inside of the wind-shield by a suction cup of fine surgical rubber. This vacuum cup is eccentrically pivoted, grips the glass firmly, and will not work loose from vibration, although it allows the shield to be swung to one side at will.

A stout metal hook attached to a rubber suction cup forms a most convenient accessory called the "Cantilever Flyfoot Vacuum Hanger," which can be attached to a mirror, glass, or any wall space or article of furniture in which it is not desired to drive a nail. A special feature of this hanger is the rubber sleeve which covers that portion of the metal hook coming in contact with the surface to which the hanger is fastened. By means of this sleeve, all danger of injuring the above-mentioned surface is obviated. [Fitzgerald-Noble Co., Richmond, California.]

"FEATHERWAITE" RAINCOAT.

This garment, although its length is 50 inches, weighs only 15 ounces, and is therefore well named "Featherwaite." It is of Oriental silk, proofed with the best grade of plantation rubber. It is entirely hand made except the buttonholes, and the garment is not cured until it is entirely finished, being then hung in the curing room on a padded hanger. It is made in a variety of shades, the most popular of which are taupe and navy. The proofing is so transparent that it in nowise affects the color of the fabrics. It is claimed that the garment will give the most satisfactory service if it is not subjected to abuse. For convenience in traveling, it is folded and enclosed in a compact envelope made of the same material as the garment. [Rosenwald & Weil, Chicago, Illinois.]

HANDY AUTO-TENT.

Camping arrangements for auto touring are fast eliminating all the discomforts while retaining the joys of gypsy life. The auto-tent here illustrated is a model of convenience and utility.



There are no poles—simply a roll of light, waterproofed khaki with eyelets which button on the side of the auto top, tent stakes, ropes and a three-foot wall. It can be adjusted in a few minutes and, furnished with a cot, forms a comfortable sleeping place, the body of the car being used as a dressing room. Two such tents can be carried, each wound around a folded cot, and stowed on the running boards, one on each side of the car. To complete the comfort of the touring camper, a small box is furnished to fit the running board which, when open, rests on folding brackets, making a table. This handy device is called the "Auto-Eat." [Strong Bungalow Co., Hartford, Connecticut.]

THE "SATIN" GOLF GRIP.

In golf playing, control over the second and third fingers while gripping the club is highly important, and also difficult of attainment, lack of such control inducing the faults known as the "hook" and "slice." The soft rubber grip here illustrated enables even the novice to properly hold his club when making a stroke, to the consequent benefit of his score. Less effort is needed, and the permanent strain on the fingers, that frequently produces muscle-wens, is thus avoided. This grip fits all hands, large or small; can be adjusted to suit all styles of grip, whether interlocking-checked or open, and insures the club being gripped at the same place all the time. Its use obviates the necessity of wearing gloves to protect the hands from callousing, and it does not become slippery when damp, as do the leather grips. It is also claimed that the "Satin" grip gives added elasticity to the stroke, adding distance to the drive. [The Satin Golf Grip Co., Chicago, Illinois.]

THE "UTILITY" HAT COVER.

For the feminine automobilist a veil is a necessity, but the ordinary chiffon veil is difficult to adjust becomingly over all kinds of hats and, moreover, affords no real protection against rain. The "Utility" hat cover here shown is of mercerized tissue, rubberized, or silk tissue, rubberized, and is ingeniously arranged for instantaneous adjustment over a hat of any size or shape. The edge furnished with an



elastic cord is drawn across the forehead directly under the hat brim, and the cover is placed over the crown of the hat. Then

the loops shown in the illustration are attached to that one of a series of buttons, that accommodates the size of the hat. These convenient and highly presentable hat covers are supplied in black, navy, tan, pearl gray, brown, etc., in a small case which can be carried in a hand bag. [Stern Specialty Co., New York City.]



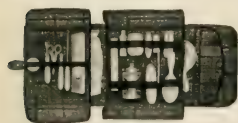
THE "UNIVERSAL" REINFORCED TUBE CONNECTOR.

The tube end, or connector, here illustrated, is designed for joining to fittings, gas tubing of all kinds—rubber, metallic, canvas-covered or insertion—without the aid of cement, wires, bands, etc. It is made of rubber, with an inner brass ferrule and tempered brass prongs. The latter are embedded and vulcanized in the rubber, gripping it tightly, thus affording a thoroughly stable joint which is fixed instantaneously. The brass ferrule supports the tubing from the inside. These connectors may be readily fitted to any kind of gas tube by simply pushing them into position. They are claimed to be unexcelled for acetylene gas, motor car and cycle lighting, joints for electric conduit insulating tubes, etc. [Reliance Rubber & Hardwood Co., London, England.]



"UTILITY ADAPTO" TRAVELING CASE.

The traveling case of waterproofed double texture fabric here illustrated is made to suit individual fittings, thus eliminating the



necessity for ready-fitted cases, which are generally very expensive and do not always suit the customer's ideas or requirements in every particular. All articles are held securely in place by adjustable, self-holding straps. The slots in the slip strap are less than an inch apart, one or as many as necessary being used to accommodate the various pieces. Large pockets hold the wash cloth, towel, night-dress, etc. When closed, the case lies perfectly flat, as shown in the second illustration, and can easily be tucked away in a suitcase, trunk or automobile. These traveling cases are furnished in leather, cretonne, linen, silk and other novelty fabrics with a foundation of waterproofed double-lined material. [The Stern Specialty Co., New York City.]

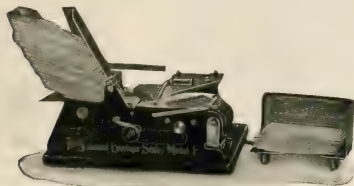
THE "RADIO" DATER.

This is a new dating stamp of the dial variety. Its indicator dial is arranged, as will be noted, around a nicked rim on a vertical cylinder revolved by turning the handle of the dater.

A novel feature of this stamp is the molding of the printing die containing the day dates in one piece with the cushion; others are the molding of the cushion piece in two close-fitting parts, and the insertion of brass linings in the mortises carrying the date blocks. The stamp represents the latest improvement—especially as regards its rubber features—in dial daters, an extensive line of which has been included in the company's productions for many years. [The R. H. Smith Manufacturing Co., Springfield, Massachusetts.]

**STANDARD ENVELOPE SEALER.**

An ingenious use of rubber is shown in the Standard Envelope Sealer where a canvas belt, with pointed rubber projections,



is used to convey and propel the envelopes, while two rubber stripping fingers combine to regulate the feed and to prevent more than one envelope at a time from passing through the machine.

The envelopes are placed in the feed hopper. The endless belt pulls the under envelope out, carrying it along to the moistening tank; a blade opens the flap and passes it over a moist felt, then it is delivered under a sealing plate and into the receiving hopper. The machine is mounted on six rubber feet and has a rubber plug for the tank. [Orrin S. Lyon Co., Metropolitan building, New York City].

BALLOON NOVELTIES.

The new design in balloons, shown herewith, is appropriately named "Old Glory," having an American flag printed upon it in the red, white and blue of the stars and stripes.



A life-like representation of a watermelon, also shown, is a unique novelty now offered in balloons. It is large size, of an attractive green color and is furnished in plain green or decorated with a two-color design, simulating a piece of watermelon, along one side. This attractive toy is made to please the youngsters' desire for noise, a squawker being used as an inflater, giving forth a more or less musical sound in the deflation. A silent style, likely to be more popular among adults, has a special closing



valve which holds the melon in shape until deflation is desired. [The Faultless Rubber Co., Ashland, Ohio.]

WORKMEN'S PROTECTIVE GLOVES.

Analyses of industrial accidents show that the hands and fingers are more frequently injured than any other members, and this is probably as true of rubber mills as of any other line of manufacturing plants. Handling the molds and machinery is always more or less dangerous and the use of knives and hand tools requires protection to prevent blisters. A strong and serviceable pliable glove for rubber workers who need forefinger and thumb protection is shown here. This leaves parts of the hand free while affording such protection where it is needed. It is made of a heavy textile material reinforced with leather patches.

Another glove, used mostly in foundry and shop work but also useful in handling hot molds, shows a leather patch on the thumb sewed in with steel ribbons so that it cannot pull out, while additional strips of tough leather sewed in with steel thread reinforce the palm and fingers and insure the worker protection against heat and abrasions. [W. H. Salisbury & Co., Inc., Chicago, Illinois.]

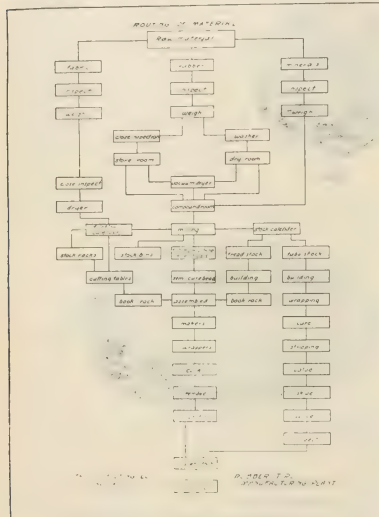


Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Polyglot Rubber Trade Directory, 1916.

THE ROUTING OF MATERIALS IN A MODERN TIRE PLANT.

IN planning a manufacturing plant the first requisite is that the materials and the articles manufactured shall be advanced from one process to the next by the most direct route, with no duplication of handling. The layout of the entire plant should be planned to this end. The diagram shows the routing of crude rubber, compounding ingredients and fabric, step by step to the finished tire casing and inner tube, in an up-to-date tire plant.

This diagram is the key to the location of the store rooms, dry rooms, working departments, machinery, tools and equipment,



ROUTING OF MATERIALS IN A MODERN TIRE PLANT.

which should be placed and arranged to permit progress of materials through the necessary processes to the finished product with the least possible deviation from a straight line. The planning should also allow possible enlargement of departments with but a minimum of disturbance of the existing plant.

Low cost, known exact cost, decreased damaged stocks and finished goods, full time and consistent production from the worker, a maximum output from equipment,—all these are necessary for success, and a well-arranged and thoroughly organized plant makes this success far better assured than one built and run under the old "rule-of-thumb" method.

TIRE AND RIM STANDARDS COMMITTEE.

The Society of Automobile Engineers has a new division of the Standards Committee to be known as the Tire and Rim Division, of which H. L. Barton is chairman. The other members of the committee are as follows: W. H. Allen, C. C. Carlton, J. E. Hale, Russell Hoopes, C. B. Whittelsey, C. E. Bonnett, John Kelsey, J. V. Mowe, J. C. Manternach, C. B. Williams, E. K. Baker, J. C. Cole and Christian Girl. Most of these men were formerly on the Truck Standards Division, or the Pleasure Car Wheels Division, which latter was discontinued last year. The new

division will have charge of standardization work in regard to solid and pneumatic tires, rims, felly bands, etc. It will therefore take up some of the incomplete work upon which the Truck Standards Division has been working, including the following subjects: Carrying capacities of solid tires; carrying capacities and inflation pressures of pneumatic tires; depth of solid metal rims for demountable solid tires.

EUROPEAN TIRE DIMENSION ANOMALIES.

THOSE who have had occasion to measure European pneumatic automobile tires, for fitting speedometers, or for other purposes, have noted that the metric measurements indicated on these tires very seldom correspond with their actual dimensions. For instance, a tire marked 760 x 90 millimeters [29.92 x 3.54 inches] does not actually measure 760 millimeters in diameter; nor does an 880 x 120 millimeters [34.65 x 4.72 inches] tire actually measure 880 millimeters. Here is the reason:

In the early days of the automobile tire industry, when Michelin, the pioneer, began to make "large tires"—large when compared with the 65 millimeter [2.56 inches] section tire which was the first type of automobile tire produced—he made them according to his own judgment, and in sizes demanded by automobile manufacturers, without any idea of the dimensions corresponding with even numbers of centimeters. He made inner tubes of 105; 120; 135 millimeters [4.13; 4.72; 5.32 inches], all of which could be fitted to rims of approximately the same size, and he adopted the method, still in vogue today in Europe, of designating automobile tire sizes by two numbers, the first referring to the diameter of the wheel with the inflated tire upon it, and the second relating to the sectional diameter of the tire.

It was soon found that chauffeurs experienced difficulty with the fractions of centimeters in ordering tires and, to make it an easy matter for them to remember tire sizes, Michelin decided to have the two numbers designating the tire terminate with the same figure or figures having a similar consonance when named in the French language. For instance, 810 x 90, stated in French is *huit cent dix, quatre-vingt-dix*. This was the origin of the automobile tire size designations that today are still current in Europe, and of which the principal ones are as follows:

Millimeters.	Equivalents in Inches.
810 x 90	31.89 x 3.54
815 x 105	32.9 x 4.13
820 x 120	32.28 x 4.72
870 x 90	34.25 x 3.54
875 x 105	34.45 x 4.13
880 x 120	34.65 x 4.72
895 x 135	35.24 x 5.32
910 x 90	35.83 x 3.54
915 x 105	36.02 x 4.13
920 x 120	36.2 x 4.72
935 x 135	36.81 x 5.32

Michelin adopted these designations arbitrarily, without making any changes in the actual sizes of the tires, the numbers marked upon them being changed to suit euphony and to make them easy to remember. Hence the anomalies and confusion.

In a number of these confused designations, however, the figures referring to the sectional diameter of the tires represent approximately the correct measurements of the casings, not when they are new, but after they have covered several hundred miles. New tire casings swell during the first few hundred miles of their wear and, an 820 x 120 millimeters [32.28 x 4.72 inches] casing, that measures when new a little more than 110 millimeters [4.33 inches] in sectional diameter, will measure its full 120 millimeters [4.72 inches] after running from 200 to 300 miles.

As far as the exterior diameter of the tire is concerned, the designating numbers marked on European millimeter tires are never more than approximate.

MOISTURE CONTENT OF AUTOMOBILE TIRE FABRIC AND ITS INFLUENCE UPON THE WEIGHT AND TENSILE STRENGTH.

By Walter S. Lewis and C. J. Cleary.*

It is well known that cotton fiber is hygroscopic. The extent to which it will absorb or give up its moisture content depends upon the condition of the material and the relative humidity and temperature of the air by which it is surrounded. Under changing atmospheric conditions, tire fabric may sometimes vary in moisture content from 3.5 to 8.5 per cent.

Automobile tire fabric is usually sold in rolls of from 100 to 500 yards each. In some instances moisture is intentionally added to the cloth when it is rolled for shipment. This moisture is sometimes added to increase the weight and strength of the fabric and sometimes to improve its appearance. Cotton tire fabric under such conditions may contain from 3.5 to 10.5 per cent of moisture per 100 parts of dry material.

The quantity of uncombined water present in the fiber has a marked influence upon the weight and strength of the fabric; to a less degree, the width and elongation and the crimp of the yarn.

From preliminary tests upon combed Sea Island tire fabric the results have shown that for each 1 per cent of moisture content, upon the basis of 100 parts dry material, there is an increase in tensile strength of approximately 7 per cent. This ratio of strength to moisture content was based upon results obtained from tests upon fabrics which contained from 0 to 10 per cent of moisture.

If dry fabric, therefore, has a tensile strength of 200 pounds per inch of width, it would test 249 pounds with 3.5 per cent moisture, 319 pounds with 8.5 per cent, and more than 325 pounds with 10.5 per cent moisture content. There is thus a difference of 70 pounds in tensile strength of the same fabric caused by a 5 per cent difference in its moisture content, *i. e.*, between 3.5 per cent and 8.5 per cent.

A consideration of the variation in weight of fabric is also important, especially when it is bought upon the pound basis. What is known as a 17½-ounce tire fabric, under so-called normal atmospheric conditions, will weigh approximately 16½ ounces under bone-dry conditions. Therefore, with 3.5 per cent moisture it would weigh 17.08 ounces and with 8.5 per cent moisture 17.90 ounces per square yard, a difference of about 5 per cent in weight. On a roll of 500 yards a difference of 5 per cent in weight would mean 25 pounds.

Many tests for the determination of moisture have been made during the past year upon 17½-ounce tire fabric. The particular fabrics employed in this preliminary investigation were produced and tested by four prominent cotton mills, three located in the North and one in the South, and all tests were made upon cloth which did not have moisture added artificially when being wound into a roll. In other words, the rolls were shipped in box cars to the purchaser as wound under the normal conditions of the mill. The rolls were sometimes exposed for a few days only, while in other instances they were exposed for weeks to the different air conditions that obtain in the winter months in unheated cars and during the summer months in ordinary box cars.

The tests included altogether more than 200 rolls and more than 400 samples were tested. The results were as follows:

Mill No.	Percent.
1.....	4.6
2.....	4.8
3.....	5.4
4.....	4.6
Average.....	4.85

The extreme variation of moisture was between 3.5 and 6.5 per cent, no single sample reaching as high as 7 per cent.

EMPIRE RED TIRES AND TUBES.

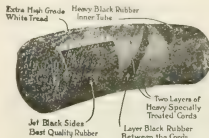
A bright red color is the distinguishing feature of Empire tires and tubes that are said to deliver the maximum mileage with a minimum cost per mile. The casing and tread of the non-skid tire are made of a durable red rubber compound which, combined with dependable fabric base, has shown, according to the manufacturer, superior strength and wearing qualities on the road. The red tubes are thick, tough and elastic and can be repeatedly repaired.



The best quality of rubber and effective curing are the basic factors that are carefully considered by the makers of Empire tires and tubes. All sizes and types of oversizes are furnished; only in red, however, including Clincher, Q. D. Clincher and Straight Edge tires with tubes to correspond. [Empire Rubber & Tire Co., Trenton, New Jersey.]

THE KOKOMO "KORD" BICYCLE TIRE.

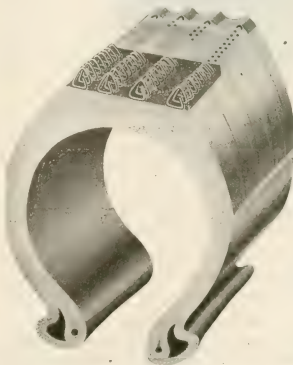
A bicycle tire that, according to its manufacturers, is immune from the effects of stone bruises and is much harder to puncture than the ordinary kind, is of special interest to bicycle riders and dealers. As the illustration shows, it is made up with an inner air tube of heavy black rubber; a layer of strong, specially treated cords, laid diagonally; a layer of black rubber, another layer of cords laid transversely to the first, and over all the outer



covering of best quality black rubber and a non-skid tread ribbed longitudinally. It is claimed that the "Kord" tire loses nothing in resiliency and is easy to repair. [The Kokomo Rubber Co., Kokomo, Indiana.]

THE LANCASTER WIRE GRIP TIRE.

"A wire grip tire with a thousand claws" is the pointed statement that is intended to attract public attention to the non-skid puncture resisting qualities of the Lancaster tire.



The non-skid and the resistance - to - puncture effects are obtained by four spiral coils of steel wire that completely encircle the tire and are vulcanized in the tread, near the surface. After the tire has been used for a few miles, the wires wear through, forming thousands of steel points that grip the road. Moreover, the closely

intermeshed wires shield the tread, thus protecting it against glass and tin. Reinforced by the wire coils and strengthened

*From Technology Paper No. 68 of the Bureau of Standards.

by extra heavy fabric, the side walls of the casing are claimed to be practically proof against blow-outs. [The Lancaster Tire and Rubber Co., Lancaster, Ohio.]

AN ENGLISH COMBINATION NON-SKID TIRE.

It is a well-known fact that rubber non-skid treads hold better on dry than on wet pavements. It is equally true that steel-studded treads hold better on wet than on dry pavements. Therefore, the Henley combination non-skid tread with steel studs and V-shaped rubber projections should hold well in all conditions of weather.

This tire is built up on an extra stout casing, with a generous thickness of rubber on the walls and a non-skid tread composed of thick V-shaped blocks of solid rubber and toughened steel studs. The rubber blocks act as a protection to the steel studs, and also permit of the power being transmitted to the road without the sudden spinning of the rear wheels and loss of studs which so often occurs when steel studs only are used. [W. T. Henley's Telegraph Works Co., Limited, 18 New Union street, Moorfields, London, E. C., England.]



PUNCTUREPROOF TIRES.

It is claimed that the problem of eliminating air and still retaining the resilient qualities of a pneumatic tire has been solved by the King tubeless tire. This universal desideratum is based on the unusual mechanical construction of the tire which is shown

in the illustration. The inside web and casing are molded in one piece, and are really a part of the tire. The web is a composition of rubber which takes the place of the inner tube in a pneumatic tire.



TOURING CAR TYPE.

It carries the load and is provided with two angular braces which rest directly over the bead when locked in the rim. These braces form a support to the web and also prevent any lateral motion of the tire, under severe loads or high speed. This web from the rim up to the dark line shown in the cut is figured as equivalent to 70 pounds of air in the inflated tire. Between this and the tread is placed a cushion, having a resiliency equal to only 40 pounds of air, which produces an easy effect upon the car. They are made in different types for touring cars, electric and light commercial vehicles and trucks; can be placed on any clincher or straight side rim and are guaranteed for 8,000 to 10,000 miles. [The Punctureless Auto Tire Co., Akron, Ohio.]

THE TWELVE-INCH TIRE.

The 12-inch tire is scarcely likely soon to become a formidable rival of the automobile tire of standard size, in public popularity, but some very interesting "stunts" may be accomplished on tires of this size—by those skilled in their performance. We re-

produce a photograph of Ed. Mayer in a vaudeville act in which, under the name of Francis Le Maire, he has gained popularity through his performance on monocycle skates, equipped with 12 x 1-inch tires. As will be noticed, the position of the foot in skating is on top of, or directly over, the wheel, a particularly difficult one to maintain.

Mr. Le Maire—or Mayer—has also attained distinction in amateur bicycle racing in the West, and in all of these events,



as well as in his stage equipment, he uses Palmer tires, made by The B. F. Goodrich Co., Akron, Ohio.

A NEW TIRE ACCESSORY.

Here is a device that stands for preparedness when the motorist encounters deep, sandy roads or faces the possibility of being stuck in the mud.

It will be seen by referring to the illustration that it is an exceedingly simple contrivance made of metal, fitting snugly

around the curve of the tire and held in place by a leather-covered chain passing around the felly. It is comparatively light in weight yet amply strong enough for the purpose for which it is designed. A pair of these trouble savers occupies only a small space in the tool box, and doubtless the day would come when they would be used to good advantage.

When power is applied, the "Dig-U-Out," as it is called, prevents the wheel from slipping by acting as a lever, and practically lifts



the car out of the deep mud or sand. It is made in 5 sizes, for pleasure cars and trucks, fitting both pneumatic and solid tires. It is confidently expected that this invention will be used on United States Army trucks in Mexico. [The Protex Co., 1790 Broadway, New York City.]

The Obituary Record.

INVENTOR OF IMPORTANT RUBBER MACHINERY.

JOHAN H. PEARCE, at one time superintendent of The L. Candee & Co.'s plant at New Haven, Connecticut, and an inventor of note in rubber machinery, died at his home in New Haven, Connecticut, June 12, aged 61 years. Mr. Pearce



J. H. PEARCE.

was a native of Montreal, Canada, where he spent the early part of his life, starting in business with the Canadian Rubber Co. Eight years later he entered the employ of the Boston Rubber Shoe Co. at Malden, Massachusetts, and from there went to the Looming Rubber Co., Williamsport, Pennsylvania, and in 1884 was transferred to The L. Candee Co.'s plant, where he rose to the position of superintendent. Some years ago he went back to Montreal to occupy a prominent position with the Canadian Consolidated Rubber Co. Two years ago he returned to New Haven and arranged for the formation of a new company, in connection with E. E. Carll, to manufacture footwear, soles and heels, as well as tennis and sporting goods, and he had made considerable progress towards securing the capital for this purpose at the time of his death. Early in the present year he submitted to a surgical operation which was supposed to have resulted successfully, although he had not been in the best of health since that time. On the date mentioned he was seized with hemorrhages and, in spite of prompt measures taken for his relief, his death occurred the same evening. He was well known in the rubber business through his connection with these prominent rubber companies and for the inventions of the automatic mixer and feeder bearing his name, and several styles of calendars, used mainly in the manufacture of shoes and sheeted goods, while several minor inventions of value in the manipulation of rubber are recorded to his credit. Mr. Pearce was a thirty-second degree Mason. He is survived by a wife and three sons, all of New Haven, and by one brother, Richard N. Pearce, of Boston.

AN ELECTRICAL EXPERT.

James T. Phelps, for many years associated with the National India Rubber Co.'s plant at Bristol, Rhode Island, died at his home, 100 Franklin street, that town, on the night of Friday, June 16, from a complication of diseases, including a hurt he received three weeks previously, in a fall at his home. He was born in Bristol in 1840 and served with distinction in the Civil War in the Seventh Rhode Island Volunteer Infantry, enlisting as a private and rising to First Lieutenant, after being severely wounded at Petersburg, Virginia, on September 20, 1864. He removed to Bristol from New York City in 1870 and took charge of the electric de-

partment of the National India Rubber Co., where he remained many years. He introduced the first electric street lights in Bristol at the time of the town's bicentennial in 1880 and also installed the first telephone system in that town. He is survived by his wife and one son.

A FAITHFUL AND EFFICIENT AUDITOR.

James T. Halland, of the auditors' office of the United States Rubber Co., New York City, died recently at his residence on Staten Island, New York. He was born in St. James' Parish, London, England, December 8, 1851. Upon completing his education at St. Marks' College in that city, he trained for an



J. T. HALLAND.

accountant, and at the age of 25 went to New Zealand, where he followed that vocation, and after ten years returned to England. Later he decided to come to America, and he entered the employ of George Watkinson, at Colchester, Connecticut, in November, 1892. Two years later he went to Providence, and in 1895 was transferred to the New York offices of the United States Rubber Co., to take charge of the work in the auditing division, remaining there with steadily increasing responsibilities up to the time of his death.

Mr. Halland married Fanny Lavarat, of London, in 1872, who survives him. He was a member of the Episcopal Church and occupied the office of vestryman in All Saints' Church, Orange, and later in Grace Church, Nutley, New Jersey. He was a solo singer for nine years in the first mentioned church and was also president of the Mendelssohn Union of East Orange. He was a Master Mason and a member of the Royal Arcanum. Mr. Halland possessed a genial disposition, was popular among his business associates, and leaves a wide circle of friends to mourn his loss.

HEAD OF AN IMPORTANT DEPARTMENT.

Otto P. Huebner, head of the wire department of The B. F. Goodrich Co., Akron, Ohio, died suddenly in East Orange, New Jersey, on May 13, at the age of 45 years. Mr. Huebner contemplated undergoing an operation within a few days after returning to Akron. He was born in Germany. His wife died last December and he was buried in the same plot with her in Yonkers, New York.

EXPLORED IN RUBBER PRODUCING COUNTRIES.

Frank Vincent, author of "Through and Through the Tropics," "Around and About South America," "Actual Africa," and "The Land of the White Elephant," died June 19 at Woodstock, New York. He was 69 years old. Mr. Vincent was a noted explorer and traveler, particularly in India, but other explorations were in Brazil, Congo Free State, Lapland and Indo-China.

A PROMISING YOUNG MAN.

Eugene Clifton Squires died June 7, at Grand Rapids, Michigan, aged 19 years. He was the youngest son of Arthur C. Squires, the veteran rubber man, and at the time of his death



E. C. SQUIRES.

was associated in the retail rubber business with his brother, Arthur R. Squires, in the Squires Rubber Co., of the above mentioned city.

Born in Brooklyn, New York, June 5, 1897, where his boyhood days were passed, he later moved to Akron, Ohio, with his parents and attended the High School in that city, finishing his education at Keyport, New Jersey, where he also learned the rudiments of the rubber business under the direction of his father.

He soon developed an aptitude for drawing and mechanical design, that was applied in his study of rubber manufacture and its devices, in which he was particularly interested.

He will long be remembered by his many friends and business associates for his frank, genial manner and lovable disposition.

Henry S. Jones, formerly with the Converse Rubber Co. and later a valued employee of The B. F. Goodrich Co. at its Boston, Massachusetts, office, died at his home in Stoughton, Massachusetts, June 4, aged 65 years.

The many friends of A. R. Duryee, the veteran rubber superintendent, will share with him his sorrow over the loss of his son Robert, who died recently at Saranac Lake, New York, at the age of 18.

JUDICIAL DECISIONS.

I. J. COOPER RUBBER CO. VS. JOHNSON. A suit was instituted by the I. J. Cooper Rubber Co., an Ohio corporation, to recover from Johnson and others, as sureties on a bond executed by the Standard Vulcanizing & Tire Co., a Tennessee corporation, as principal.

Following the terms of a contract, the rubber company consigned tires to the Tennessee corporation which had executed a bond to secure the rubber company against breach of contract by the Standard Vulcanizing & Tire Co.

The defense of the sureties was that the complainant rubber company had not complied with the Tennessee foreign corporation acts, and was doing business in that State through the agency of the tire company; that it could not, therefore, maintain the suit. The Chancery Court sustained this defense. The plaintiffs appealed and the Supreme Court of Tennessee reversed the decision of the court below. Held, that a foreign corporation which consigned tires for sale to a company in the State, was not doing business within the State to render necessary compliance with the foreign corporation act as a condition precedent to its right to recover from the sureties, since the business of a factor or commission merchant, one whose business is to receive and sell goods for commission, is not the conduct of an agency or business for the consignor of the goods. The factor sells to customers at his own risk and the consignor does not exclusively own the proceeds (182 Southwestern Reporter, 593).

BLACKWOOD TIRE & VULCANIZING CO. VS. AUTO STORAGE CO. The defendant sold an automobile to one Cooper, retaining title. Thereafter Cooper bought from the plaintiff, and fitted to the machine, certain tire casings; plaintiffs not retaining title. The machine was not fully paid for and the defendant took possession, and sold it. Cooper made no claim to the tires when defendant acquired the machine and made no objection to its sale. After the sale, however, at the instance of the plaintiffs, Cooper sold,

or purported to sell the tire casings to the plaintiff, their value at that time to be credited on Cooper's account. Suit was brought on this alleged title and the tire casings were replevied. The trial court dismissed the suit and an appeal was taken before the Court of Civil Appeals, which affirmed this judgment. Appeal was then taken before the Supreme Court of Tennessee. Held, that both courts were correct, that, where the purchaser of an automobile (title to which is retained by the seller) fits the machine with tires, and the seller on non-payment recovers the machine, title to the tires passes to the seller, the seller of the casings not having retained title to them, such being the rule of "accession" which supports the right of the owner of corporeal property, real or personal, to any increase thereof from any cause, either actual or artificial (182 Southwestern Reporter, 576).

IN THE MATTER OF AN APPLICATION FOR THE REVOCATION OF WILLIAM TAYLOR'S PATENT. In 1905 a patent was granted for "An application in golf balls." The specification stated that the principal object of the invention was to obtain better results in the flight of the ball than had been possible with balls of known types. One of the claims was "A golf ball having a spherical surface pitted with isolated cavities, forming the cavities substantially circular in plan, with steep sides and flat or concave bottoms and of a depth not exceeding one-eighth of their diameter." In other claims it was stated that the cavities were to be semi-elliptical in section, the minor axes being radial to the ball, and, also, the cavities were to be of a diameter not less than 10 hundredths, nor greater than 15 hundredths of an inch, and of a depth not exceeding 14 thousandths of an inch. The specification stated that preferably the cavities should occupy not less than a quarter, nor more than three quarters of the surface of the ball. On a petition for the revocation of the patent, the petitioners alleged anticipation by certain specifications, prior public use, want of subject matter, and want of utility. At the hearing the holders of patent contended that their experiments, made with a driving machine, showed that the patented golf balls had a better flight than certain balls having a different marking. It was proved that it had long been customary to make indentations in the surface of golf balls to improve the flight, and that at the date of the patent there were golf balls with projections in the form of a segment of a sphere and balls with corresponding depressions, also balls with circular depressions produced by a punch, and balls with raised lines or ridges on their surface. Held at the trial, that the patentee had not shown what particular depth of the depressions or steepness of their sides was the best; that he had not exactly specified the improvement claimed; and that the patent was invalid for want of subject-matter. An order for revocation was made. The respondents to the petition appealed to the Court of Appeal, and this court held, that the patent was invalid for want of novelty and of subject-matter.

The appeal was dismissed with costs (Central Court of Appeal, London, February 1, 1916).

WINS FIGHT OVER TRADE NAME.

The Newark, New Jersey, District Federal Court, on June 8, 1916, filed a decision enjoining the F. W. Devoe-C. T. Reynolds Co. from the use of the word "rubberet" or any other name resembling it. This means that the Rubberet Co., of Newark, has won its second suit in defense of its trade name. To establish the name, the company has spent thousands of dollars annually. The first suit was brought against the Rubber Bound Brush Co., Belleville, New Jersey.

It was decided in favor of the plaintiffs and the decision was later upheld in the Court of Errors.

JAR RINGS IN GERMANY.

Owing to the scarcity of rubber in Germany, and the necessary use of reclaimed rubber, it is now permissible to use compounds containing not over 1 per cent of lead for the manufacture of jar rings for canned fruits, etc. Rubber nipples for nursing children must, however, be lead free.

News of the American Rubber Trade.

OUTING OF THE RUBBER CLUB OF AMERICA, INC.

EXTENSIVE preparations are being made by the committee having in charge the seventeenth annual outing of this club at the Vesper County Club, near Lowell, Massachusetts, on Tuesday, July 18. It is planned to run a special train of sleeping cars, club car and diner from New York, leaving Grand Central Station at 11:30 P. M. on the 17th. Western members will assemble at Cleveland, Ohio, and will travel by special sleeping cars to Springfield, Massachusetts, where they will be joined to the special train from New York. The entire party from New York, Trenton and Akron will thus arrive at the Vesper County Club by about 8:30 on the morning of the outing. Breakfast will be served on the dining-car on the train. There will also be special cars from Boston to the Vesper Country Club. Similar accommodations will be made for the return of the members to their respective destinations and round-trip tickets will be issued at a special price.

For reservations on these trains, members are requested to make immediate application to P. E. Young, Acushnet Process Co., New Bedford, Massachusetts.

WESTINGHOUSE ELECTRIC & MANUFACTURING CO. ANNUAL MEETING.

The annual meeting of the Westinghouse Electric & Manufacturing Co. was held at East Pittsburgh, Pennsylvania, on June 14. In addition to transaction of purely routine business, the following directors whose terms expired on June 14 were re-elected: J. W. Marsh, G. E. Tripp, H. H. Westinghouse, and A. H. Wiggin. Samuel M. Vaulcan, vice-president of the Baldwin Locomotive Works, of Philadelphia, was also elected a director, of the class whose term will expire at the annual meeting to be held in 1919.

The consolidated statement of income gives the gross earnings of the company as \$50,269,239.84, and the net manufacturing profit as \$9,429,895.76. Other income, with interest deductions, makes the net profit available for dividends and other purposes, \$9,666,788.68. The sales billed and net income for the year are in excess of any previous year in the history of the company. These results were attained in part from orders for war munitions, the shipments on account of which amounted to \$8,578,266.

WESTERN DIVISION OF THE NATIONAL ASSOCIATION OF WASTE MATERIAL DEALERS MEETS IN CHICAGO.

The western division of the National Association of Waste Material Dealers met at the Sherman House, Chicago, Illinois, on June 13. In his address President Birkenstein urged the members to advance the work of the association by increasing the membership of the western division. The attendance was good and that considerable progress had been made since the last meeting was evident from the favorable reports of the various committees. Among those present were the following: Louis Birkenstein, president of the National association; Harry Birkenstein, Victor Loewenthal and Charles Muehlstein.

SCRAP RUBBER DIVISION MEETING.

The Scrap Rubber Division of the National Association of Waste Material Dealers met at the Hotel Astor, June 21. Chairman Paul Loewenthal presided over the very successful meeting and marked progress was reported since the last meeting. There were about 20 representative members of the trade present who took part in the business of the meeting and the general discussions with enthusiasm. It was decided that the

scrap circular B will be revised and issued on July 1 of each year. A committee will be appointed to make recommendations for the necessary changes in the circular. Copies can be obtained from the secretary of the National association.

RUBBER COMPANY DIVIDENDS.

The Apsley Rubber Co. has declared the usual semi-annual dividend of $3\frac{1}{2}$ per cent, payable July 1 to stockholders of record June 16.

The Exello Tire & Rubber Co. has declared a semi-annual dividend of $3\frac{1}{2}$ per cent on preferred stock, payable July 1.

The Kelly-Springfield Tire Co. has declared a quarterly dividend of $1\frac{1}{2}$ per cent on preferred stock, payable July 1 to stockholders of record June 17.

The New Jersey Zinc Co., New York City, has declared an extra dividend of 5 per cent, making six dividends declared so far this year, in all 38 per cent, on the \$35,000,000 capital stock. Besides two quarterly dividends of 4 per cent each, the company has paid two extra dividends of 10 per cent and two of 5 per cent each. The six dividends declared this year require payment of \$13,300,000 in cash to stockholders. The dividends paid in January and February, however, amounting to 14 per cent, or \$4,900,000, were out of profits accumulated prior to January 1, and not out of those of the current year.

The Rubber Goods Manufacturing Co. paid a regular quarterly dividend of $1\frac{3}{4}$ per cent on the preferred stock on June 15, to stockholders of record June 10.

The Westinghouse Electric & Manufacturing Co. has declared a quarterly dividend of $1\frac{3}{4}$ per cent on the preferred stock, to be paid July 15, and a dividend of $1\frac{1}{2}$ per cent on the common stock for the quarter ending June 30, to be paid July 31, both dividends payable to stockholders of record June 30.

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of shares of rubber manufacturing companies on June 24 are furnished by John Burnham & Co., 115 Broadway, New York City, and 41 South La Salle street, Chicago, Illinois:

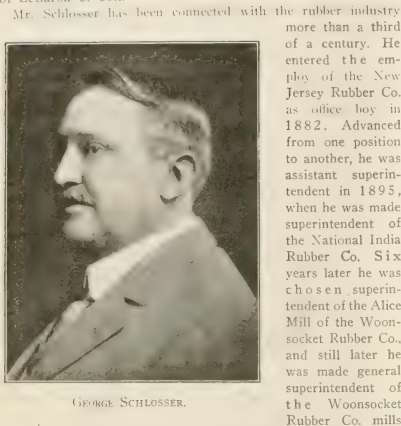
	Bid.	Asked.
Ajax Rubber Co. (new).....	64	66
Firestone Tire & Rubber Co., common.....	870	
Firestone Tire & Rubber Co., preferred.....	112	114
The B. F. Goodrich Co., common.....	74 $\frac{1}{2}$	74 $\frac{3}{4}$
The B. F. Goodrich Co., preferred.....	113 $\frac{1}{2}$	114
Goodyear Tire & Rubber Co., common.....	233	237
Goodyear Tire & Rubber Co., preferred.....	106 $\frac{1}{2}$	107 $\frac{1}{2}$
Kelly-Springfield Tire Co., common.....	71	73
Kelly-Springfield Tire Co., 1st preferred.....	96	96 $\frac{1}{2}$
Kelly-Springfield Tire Co., 2nd preferred.....	96	
Miller Rubber Co., common.....	350	357
Miller Rubber Co., preferred.....	105	106
Portage Rubber Co., common.....	119	120
Portage Rubber Co., preferred.....	120	122
Rubber Goods Manufacturing Co., preferred.....	88	91
Swinehart Tire & Rubber Co., common.....	52 $\frac{1}{2}$	53 $\frac{1}{2}$
United States Rubber Co., preferred.....	108 $\frac{1}{2}$	110

OLDTOWN COMPANY SUCCEEDS XENIA.

The Oldtown Rubber Co., Xenia, Ohio, notice of whose incorporation appears elsewhere in this issue, has taken over the rubber mills, water power, and 23 acres of land of the Xenia Rubber Manufacturing Co., the latter company having ceased operations. The new owners are making extensive alterations of the premises, with the object of greater development of the water power, and modernizing the equipment. The Oldtown company has acquired the patents covering the "Springfield Rubber-Abrasive Polishing Wheels," and will develop this line in conjunction with its extensive manufacture of rubber heels and soles, both for the factory and shoe repairing trade, baby carriage tires, and molded work for mechanical purposes.

MR. SCHLOSSER VICE-PRESIDENT OF THE NATIONAL INDIA RUBBER CO.

At a meeting of the directors of the National India Rubber Co., Bristol, Rhode Island, last month, George Schlosser was elected vice-president, to fill the vacancy caused by the death of LeBaron C. Colt.



GEORGE SCHLOSSER.

Mr. Schlosser has been connected with the rubber industry more than a third of a century. He entered the employ of the New Jersey Rubber Co. as office boy in 1882. Advanced from one position to another, he was assistant superintendent in 1895, when he was made superintendent of the National India Rubber Co. Six years later he was chosen superintendent of the Alice Mill of the Woonsocket Rubber Co., and still later he was made general superintendent of the Woonsocket Rubber Co. mills at Woonsocket, Rhode Island, and Millville, Massachusetts; the L. Candee & Co. plant at New Haven, Connecticut, and the Lawrence Felting Co. at Millville, Massachusetts.

Mr. Schlosser has had a wide experience in the manufacture, not only of rubber footwear, but also of mechanical rubber goods, and is eminently fitted for the still broader responsibilities which are likely to be added through his recent election.

ARTHUR F. TOWNSEND VOLUNTEERS.

Arthur F. Townsend, president of the Manhattan Rubber Manufacturing Co., has been appointed assistant to Colonel Sternberger, Chief of the Quartermaster's Corps, N. G. N. Y., with the rank of lieutenant-colonel. Colonel Townsend resigned from the position of Chief Quartermaster last January and was placed on the reserve list. His long and varied experience in the National Guard made his services invaluable to the state and he promptly responded to the call.

THE GUNN RUBBER INTERESTS.

The Gunn Rubber Co., whose incorporation is noted elsewhere in this issue, is located at 61 East Main street, New Britain, Connecticut. The officers are as follows: A. P. Gunn, president and treasurer; Edward F. Gunn, vice-president; Albert E. Kilby, secretary.

The president, A. P. Gunn, was also interested in the Todd Rubber Co., of Watbury, New London, and Pittsfield, Massachusetts, and also the E. J. Todd Rubber Co., Hartford, Connecticut, but has relinquished his holdings in the various companies with the exception of the E. J. Todd Rubber Co., at Hartford, of which he has purchased the entire stock. The new officers of this latter concern are as follows: A. P. Gunn, president and treasurer; M. E. Gunn, vice-president; Edward F. Gunn, secretary. Edward F. Gunn formerly held a one-quarter interest in the Todd Rubber Co., of Pittsfield, and was secretary of that company up to August 31, 1915.

PERSONAL MENTION.

Arthur W. Stedman, whose recent association with the Hagemeyer Trading Co., New York City, as manager of its crude rubber department, was mentioned in *THE INDIA RUBBER WORLD* last month, sailed for Europe on the "Finland," on June 14. He expects to be away about six or eight weeks.

C. Berlage, rubber and tobacco broker of Amsterdam, Holland, has opened offices at Medan, on the East Coast of Sumatra, and at Soerabaya, Java. With a view of extending his brokerage business and purchasing for American houses, he has arranged with the Hammesfahr Co., 68 Broad street, New York City, to represent him in this country.

W. J. Proctor, general manager of the Dunlop Rubber Co. of Australasia, Limited, Melbourne, Australia, was in this country last month and called on the machinery and supply houses and also visited several tire plants.

W. L. Wadleigh, for many years prominent in the rubber trade in Boston, Massachusetts, and now the head of Wadleigh Co., Limited, Singapore, Straits Settlements, returned from that city early in June, after an absence of nearly seven months, during which he accomplished a most satisfactory amount of business. One of the first things he did upon his return to this country was to go trout fishing in New Hampshire.

H. J. Morehead has been promoted to managership of the New York City branch of The B. F. Goodrich Co., Akron, Ohio. Mr. Morehead has been manager of the Detroit, Michigan, branch since 1908. Paul T. Oppen, formerly assistant manager of the Detroit branch, succeeds Mr. Morehead as manager.

The Denver depot of The B. F. Goodrich Co., Akron, Ohio, at 1422-1424 Court place, Denver, Colorado, is now in charge of C. A. Cotter, formerly chief adjuster at the St. Louis, Missouri, branch. H. E. White, whom Mr. Cotter succeeds as manager, has been transferred to a factory position. J. K. Laird, formerly Kansas City adjuster, is the new assistant to the local manager of the Denver depot, and C. L. Harding is new chief clerk.

I. L. Miller, secretary and manager of the foreign department of the Faultless Rubber Co., Ashland, Ohio, has recently returned from a fishing trip in Michigan.

Collier W. Baird, assistant treasurer, Rubber Trading Co., 9-15 Murray street, New York City, is a member of Essex Troop, N. J. N. G., that was ordered to the Mexican border June 26.

M. F. Hall has been placed in charge of the Louisville, Kentucky, depot of The B. F. Goodrich Co., Akron, Ohio, relieving W. H. Sheehy, who will be assigned to other duties.

Wilmer Dunbar will sever his connection with the Greensburg Tire & Rubber Co., Greensburgh, Pennsylvania, July 1.

E. E. Fay, sales manager of the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, is at present on a six weeks' trip to the Pacific Coast, visiting the Company's branch offices and distributors in the principal western centers.

M. H. Whipple, formerly branch manager of the Fisk Rubber Co., Chicopee Falls, Massachusetts, at Fresno, California, is now manager of the San Francisco branch, succeeding E. N. Merguire. R. W. Carter, in charge of the Sacramento branch, goes to Fresno and C. H. Francee assumes charge in Sacramento.

Rubber bands have been put to a new use by the proprietor of a barber shop in a western city, who suspends Japanese fans from the ceiling, over his chairs, by rubber bands. The fans are all kept constantly in motion by the draft from one electric fan at the end of the room. The rubber band gives sufficiently to enable the barber, when he has finished a shave, to use the suspended fan to dry the customer's face.

PRESIDENT ROBINSON OF CANADIAN CONSOLIDATED.

WILLIAM HEZEKIAH ROBINSON, the new president of the Canadian Consolidated Rubber Co., Limited, Montreal, was born in Waterloo, Quebec, Canada, April 17, 1848, and educated at Shefford Academy in that town, Bishops College, Lennoxville, and military schools at Montreal, receiving a first-class certificate in infantry in 1865, and in school gunnery in 1869.

He began business life in a general store in Waterloo in 1867, and in 1870 bought out the business and became head of the firm known as Robinson Brothers & Stevens. He withdrew from that firm in 1874 on account of ill health and two years later entered the service of the Eastern Townships Bank as accountant. Three years later he instituted the branch at Granby of which he became manager, and ten years afterward established the Huntingdon, Quebec, branch which he managed until 1896, when he returned to Granby, where he remained as manager until his retirement from banking in 1908. In the meantime, he went to British Columbia and opened a branch of the bank at Grand Forks. Since 1908 he has devoted his time chiefly to the interests of the Granby Consolidated Mining, Smelting & Power Co., Limited, of which he is vice-president; to the Crow's Nest Pass Coal Co. and the Granby Printing & Publishing Co., Limited, in which companies he has been a director.

He was a director of the Granby Rubber Co., Limited, up to the time of its amalgamation with the Canadian Consolidated Rubber Co., Limited. In 1915 he became a director of the Dominion Rubber System, and on the death of President J. H. McKechnie, was elected to that office.

His military record includes active service during the Fenian raid, when he served as ensign. On the formation of the 79th Battalion, Shefford Highlanders, he was appointed captain and paymaster and later received a commission as major, retiring in 1879.

Mr. Robinson is past master of Shefford Lodge, No. 52, A. F. and A. M. He has three sons, two of whom recently left for the defense of the British nation, one being lieutenant of the 73rd Royal Highlanders, and the other a captain in the C. O. T. C.

TO INVESTIGATE ANTIPODEAN TRADE.

J. A. McKenzie, manager of the Victoria, British Columbia, branch of the Canadian Consolidated Rubber Co., Limited, sailed last month for Australia and New Zealand where he will spend several months in investigating the footwear needs of those islands, with the idea of establishing a district agency there. He expects to spend about seven weeks in Sydney, a month in Melbourne, and a week or two each in Adelaide, Brisbane and New Zealand. While he will devote most of this time in studying the

rubber footwear trade, he will look up the tire business to some extent. He will appoint local agents in all important cities in this territory.

TRADE NOTES.

Arthur Jackson Wills, manufacturer of special rubber machinery, North Brookfield, Massachusetts, has applied for a patent on what he terms a "bath cap edging" plaiter which, he claims, produces an absolutely correct plaited edging on either cured or uncured rubber sheet. He has also evolved another machine of the same class which will plait around the edges of disks of pure gum stock.

The Adamson Manufacturing Co., East Palestine, Ohio, is erecting an addition, to be used for the increased production of vulcanizers and new, patented devices of interest to the automobile industry. The building, which will be of brick and glass construction, 50 by 150 feet and three stories high, with a total of 22,500 square feet of floor space, is expected to be ready for occupation some time in July.

The I. T. S. Rubber Co., Elyria, Ohio, manufacturer of cushion heels, is building a brick warehouse to accommodate increased business.

The National Rubber Co., Pottstown, Pennsylvania, is erecting a five-story building, 170 by 134 feet, of reinforced cement and glass construction. This company recently donated a set of tires for the new auto ambulance of the Goodwill Fire Co. at Pottstown.

The Standard Asphalt & Rubber Co., Jersey City, New Jersey, recently qualified to transact business within the State of Oklahoma.

The toy makers of the United States met at the Hotel McAlpin, New York City, June 9, and formed The National Association of Toy Manufacturers. Permanent offices will be opened in this city and a competent secretary engaged to attend to the association's affairs. It is expected the rubber toy manufacturers will become identified with this movement, that will undoubtedly result in benefit to the industry.

The American Hard Rubber Co., New York City, is about to erect at its plant at College Point, Long Island, New York, a three-story building 200 by 50 feet, to be used as a paper box factory and carpenter shop.

The Dayton Rubber Manufacturing Co., Dayton, Ohio, is installing hydraulic vulcanizers and adding to its machinery and mold equipment. The work will be completed within two or three weeks, and will practically double the present capacity of those departments.

The Cameron Machine Co., Brooklyn, New York, was recently favored with an order for ten slitting and rewinding machines from the Russian government. It is understood that these machines will be employed in general commercial work in Russia for converting fabrics, paper and other material into strip for a variety of uses in Russian textile and paper trades, also for medical and surgical purposes.

Following a reorganization of the company, the name of the Dings Electro-Magnetic Separator Co., Milwaukee, Wisconsin, has been changed to the Dings Magnetic Separator Co. The capital stock has been increased from \$10,000 to \$100,000 and the new officers of the company are: Robert A. Manegold, president and treasurer; Frank W. Manegold, vice-president, and William E. Wehr, secretary. These officers also constitute the board of directors.

The De Vilbiss Manufacturing Co., Toledo, Ohio, has purchased from the Davidson Rubber Co., Boston, Massachusetts, a portion of its hard rubber equipment, which will be transferred to Toledo and will be used in the manufacture of hard rubber parts in connection with the De Vilbiss company's extensive line of atomizers.

TRADE NOTES.

The Rubber Club of America, Inc., was represented in the Cincinnati, Ohio, Preparedness Parade on June 24. Fifty thousand people participated in the parade, and while the rubber interest, from a manufacturing standpoint, is not extremely heavy in that city, nevertheless, from the various branches of the trade, 100 men formed a company, and marched, headed by a banner bearing the legend: "Rubber Club of America."

The American Hard Rubber Co., 11 Mercer street, New York City, has built several model four-family apartment houses at College Point, Long Island, New York, for the use of their employees.

Heidman & Haynes, Cuyahoga Falls, Ohio, is a relatively new machinery concern specializing in experimental work for rubber mills.

The United States Rubber Co. of California has opened a factory branch at 906 Sixth street, Sacramento, which will handle all territory to the Oregon line. R. J. Jones, who has been covering this territory for the past five years, will be manager. This store will carry a full line of the United States Rubber Co.'s products.

F. Bierman & Sons Metal & Rubber Co., St. Louis, Missouri, has increased its capital stock from \$16,000 to \$32,000. This company was formed to deal in all grades of rubber and metals, succeeding the firm of F. Bierman & Son in the same line, and was incorporated under the laws of the State of Missouri in October, 1912. The incorporators are: F. Bierman and two sons, Samuel L. Bierman and Isaac Bierman.

Developments along the Mexican border recently have tested the attitude of employers toward employees who have answered the call to arms. The United States Rubber Co., New York City, of which the United States Tire Co. is an associate, offers full salary and protection of position during absence, the announcement affecting the employees of 37 factories distributed throughout the country and over one hundred branches and stores.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, will hold positions open for employees belonging to the National Guard while they are in service, both at camp and away, for the period of one year. They will pay the married men or single men with dependents three-quarters of their average salary and single men without dependents one-half, and no deductions will be made for the amount received by employees from the government. Should any men now employed desire to enlist, this same rule will apply, with the exception that such employees must have been in the employ of the company for six months prior to this date, this proviso being intended to prevent the employment of men who have in mind enlisting.

BEACON FALLS PLANT AT COLLEGE POINT.

The Beacon Falls Rubber Shoe Co., Beacon Falls, Connecticut, has leased 60,000 square feet of factory space at College Point, Long Island, New York, in the one and two-story modern factory buildings at Tenth street, running from Third to Fourth avenues. The College Point plant will be used by the Beacon Falls company as a branch for the manufacture of tennis shoes. Three hundred men and girls will be employed at the start.

LEAD COMPANIES CONSOLIDATE.

The Eagle White Lead Co., Cincinnati, Ohio, and the Picher Lead Co., Joplin, Missouri, have united, and the new company is to be known as the Eagle-Picher Lead Co. with general offices at 208 South La Salle street, Chicago, Illinois.

John B. Swift, who has been president of the Eagle White Lead Co., was elected chairman of the board and chairman of the executive committee. O. S. Picher was elected president and general manager; R. W. Evans, vice-president and general sales manager; S. M. Evans, vice-president; Thomas S. Brown,

Jr., treasurer; Joseph Hummel, Jr., secretary. These, with F. L. Perrin, Frederick Hertenstein and J. Edward Webb, comprise the board of directors.

It is announced that the capital stock of the new company has been authorized at \$10,000,000, of which \$1,000,000 is preferred, \$7,000,000 common, outstanding, and \$2,000,000 common in the treasury. It is not planned to offer the stock to the public, but employees of the company will be given an opportunity to subscribe to \$500,000 worth of the common stock at par, upon easy payment terms.

It is stated that the combined business of the two companies amounts to more than \$15,000,000 per year. The new company will engage in the mining and manufacture of pig lead and spelter, all lead products and pigments, plumbers' goods, etc. The company has plants at Henryetta, Oklahoma; Galena, Kansas; Joplin and Webb City, Missouri; Collinsville, Illinois; Cincinnati, Ohio, and Newark, New Jersey. All present branches will be maintained and a number of other district offices opened in the near future.

LOWER PRICES IN ZINC OXIDE.

The New Jersey Zinc Co., New York City, announces the following prices per pound on Florence brand, French process, oxide of zinc, for shipment on contract, during the third three months of 1916:

	Carloads.	Less Carloads.
White Seal	17 cents	17½ cents
Green Seal	16½ cents	16½ cents
Red Seal	16 cents	16½ cents

The above prices are based upon shipments in barrels f. o. b. shipping point, with freight allowance as heretofore on carload lots only.

The above prices are effective July 1, 1916, and are subject to change without notice.

SOME NEW KETONE SOLVENTS.

One of the interesting developments of industrial chemistry in the past few months is the production of Ketone solvents. These materials are obtained as by-products in the manufacture of a new series of dyes, and are characterized by their exceptional solvent properties. The research department of the Rubber Trade Laboratory, which has succeeded in separating this material into three distinct fractions, thus describes them:

Ketone Solvent No. 1 has a specific gravity of 0.880 to 0.900—and is entirely volatile below 100 degrees C. This solvent will probably be used to a large extent to replace acetone. It has also been tested out in the preparation of cements in the rubber and celluloid industries, and the preliminary experiments indicate that it can be used successfully for this purpose.

Ketone Solvent No. 2 has a specific gravity of 0.900 to 0.950—and has a boiling point of 100 to 150 degrees C. As a solvent, it has been recommended as a substitute for toluol and xylol. These latter materials have a boiling point of 111 and 138 degrees C., respectively.

Ketone Solvent No. 3 has a specific gravity of 0.940 to 0.970—and boils at a temperature between 150 and 180 degrees C. This is a high boiling product, and is likely to find extensive use as an auxiliary material in the manufacture of reclaimed rubber.

A material designated as "Yocarbon" has also been isolated from the melt. This is a pitch-like substance having a melting point of 250 degrees C. and a specific gravity of 1.100.

A means to prevent accidents due to the slipping of belts on pulleys and sudden starting of machines has been devised in the form of a small wooden wedge, covered at its tapered end with sheet rubber. To one side of the wooden strip—which is about a foot long, four inches wide and an inch and a half thick—two clips are attached, and when in use the rubber-covered wedge is inserted between the belt and the pulley, these clips fastening over the edge of the belt and holding it firmly in place.

NEW INCORPORATIONS.

Abdominal Supporter Co., Inc., The, May 29 (New York), \$12,000. H. L. Brown, L. A. Hammersley, and Alex H. Sands, Jr.—all of 200 Fifth avenue, New York City. To manufacture elastic appliances, etc.

Acme Rubber Co., March 3 (Ontario), \$400,000. F. D. Law, 471 Yonge street, Toronto, Ontario. Principal office, Brampton, Ontario. To manufacture rubber tires, rubber goods, etc.

Aero-Cushion Tire Agency, Inc., April 15 (California), \$20,000. W. B. Denhart, J. O'Shannessey, and George A. Ledoux—all of San Jose, California. Principal address, San Jose, California. To deal in auto and vehicle tires.

Akron Tire Repair School, May 15 (Ohio), \$10,000. A. G. Zeller (president), W. S. Hunter (general manager), C. B. Keener (secretary-treasurer). Principal address, 46-48 North Main street, Akron, Ohio. To teach men the tire repair business.

American Tire Sales Corporation, May 18 (Delaware), \$100,000. William F. O'Keefe, George G. Stiegler, E. E. Wright—all of Wilmington, Delaware. Principal address, 901 Market street, Wilmington, Delaware. To manufacture and deal in automobile tires, tubes, etc.

Bolivia-Brazil Rubber & Timber Corporation, February 7 (Arizona), \$1,000,000. Hon. Adolfo Ballivian, 2 Stone street, New York City; William L. Glorieux, Jr., Hon. Daniel S. Voorhees, F. B. McMillan, Dr. Britton D. Evans, Samuel T. Busby. To develop rubber plantations, etc.

Chicago Tire Pump Co., May 4 (Illinois), \$7,200. George Mahler, Arthur E. Stenzel and Anna Mahler. Principal address, 20 East Jackson Boulevard, Chicago.

City Rubber Corporation, June 10 (Delaware), \$550,000. George G. Stiegler, N. T. Parsons, E. E. Wright—all of Wilmington, Delaware. To manufacture and deal in automobile tires, etc.

Crude Rubber Importing Corporation, June 27 (New York), \$105,000. S. C. T. Dodd, 37 Wall street, George F. Jebbett, 3161 Broadway—both of New York City, and Tracy S. Buckingham, 204 Livingston street, Brooklyn, N. Y.

Denver Tire Service, Inc., June 9 (New York), \$1,000. A. Foshay, 120 Broadway; Russell Goldman, 1190 Madison avenue—both of New York City, and A. G. Thaarum, 1331 Herschell street, Westchester, New York.

Detroit Tire Co., June 9 (New Jersey), \$10,000. Robert S. Mantell, 3033 W. Grand Boulevard; Ray Wirtz, 1419 Dime Bank Building; J. E. Welch, 944 Woodward avenue—all of Detroit, Michigan. To manufacture, deal in and repair automobile tires, etc.

Druggists Rubber Co., June 17 (Ohio), \$10,000. O. D. Eshelman, L. C. Shaver.

Miami Rubber Co., June 17 (Ohio), \$40,000. E. H. Botsford, G. C. Congdon.

Gunn Rubber Co., May 21 (Connecticut), \$2,500. A. P. Gunn (president and treasurer), Edward F. Gunn (vice-president), and Albert E. Kilby (secretary). Principal address, 61 East Main street, New Britain, Connecticut.

Halifax Rubber Co., May 11 (Pennsylvania), \$5,000. John H. Klingman, A. G. Bashoar, of Millersburg, and A. M. Smith, Halifax, Pennsylvania. Principal office at Halifax, Pennsylvania. To manufacture and deal in rubber goods and novelties.

Newmann Rank Tire Co., Inc., May 23 (New York), \$25,000. Samuel A. Newman, 316 West 113th street, Ernest Rank, 410 Lenox avenue, and V. C. Bogardus, 140 Nassau street—all of New York City. To manufacture rubber tires, etc.

North American Rubber Co., June 8 (Delaware), \$250,000. S. S. Adams, Jr., H. M. Kennedy, M. B. F. Hawkins—all of Wilmington, Delaware. Principal office, Delaware Corporation Co.,

Tenth and Market streets, Wilmington, Delaware. To manufacture and deal in automobile tires, etc.

Oldtown Rubber Co., The, May 8 (Ohio), \$30,000. David Shearman (president), D. A. Bickett (secretary), L. M. Bickett (treasurer). Principal address, Xenia, Ohio. To manufacture rubber heels and soles, and baby carriage tires, etc.

Overtire Service Co., Inc., June 16 (New York), \$1,000. Philip Rosenberg, 121 Hopkins street, Isaac Slutsky, 344 Jay street, and Abraham Kempner, 2021 Croysey avenue—all of Brooklyn, N. Y. To manufacture tires, rubber goods, etc.

Passaic Tire Co., May 31 (New Jersey), \$25,000. Hyman Morris and Gussie Morris, 279 Madison street, Yetta Evansky, 56 Lexington avenue—all of Passaic, and Harris Evansky, 799 Paterson avenue, Wallington—both in New Jersey. Principal address, 39 Lexington avenue, Passaic. To manufacture and deal in tires, etc.

Schultz Tire & Supply Co., May 4 (Illinois), \$5,000. Frederick C. Schultz, S. H. Schultz, and Emil A. Schultz. Principal address, 6737 Sheridan Road, Chicago. To deal in tires and supplies, also have a complete vulcanizing plant and service station.

Reliable Tire & Rubber Co., of New England, June 6 (Massachusetts), \$25,000. Joseph T. Gilman, 9 Lawson road, Winchester; G. S. Van Voorhis, 440 Newbury street, Boston; Hermon Holt, Jr., 45 Pleasant street, Newton Center—all in Massachusetts. Principal address, Boston, Mass. To deal in tires, etc.

Sanitary Rubber Tooth Brush Co., June 10 (Delaware), \$100,000. Frank L. Mettler, Charles F. Bowers, Moses Weil—all of Wilmington, Delaware. To manufacture tooth brushes of all kinds.

Supreme Rubber Co., June 17 (Ohio), \$25,000. Chester A. Teits, Dan Zeisloft and others.

Wright Tire & Rubber Co., May 20 (Ohio), \$100,000. Richard Ryan, Robert Wright, C. R. Wagner, C. F. Hiller and A. C. Foose. Principal office, 2041 E. 105th street, Cleveland, Ohio. To manufacture rubber goods in general and the Wright Anti-Skid Puncture Proof Pneumatic tires in particular, together with a demountable rim.

Westgard Tire & Rubber Co., June 20 (Delaware), \$1,500,000. A. L. Westgard, 18 Old Slip; J. E. Levi, 50 Broad street and R. S. Ireland, Fifty-first street and Broadway—all of New York City. Principal address, 202 Equitable Building, Wilmington, Delaware. To manufacture rubber, rubber tires, rubber goods, etc.

Western Tire & Garage Co., January 27 (New Mexico), \$100,000. J. D. Hamlin (president), C. A. Roberson (vice-president), M. M. Craig (secretary), C. L. McClellan (second vice-president), J. A. Oden (treasurer). Principal office, Texico, New Mexico. To manufacture and deal in automobile tires.

Wakefield Motor Reconstruction Co., June 1 (Massachusetts), \$25,000. Thomas E. Dwyer, 12 Gould street; John D. Dwyer and Dennis F. Dwyer, 228 Spring street—all of Medford, Massachusetts. Principal office, Wakefield, Massachusetts. To manufacture and deal in automobile tires, etc.

LATE CUSTOMS RULING.

It seems that rubber bulbs are not druggists' sundries if they are made to be used on pyrographic outfits. This was the decision of Judge McClelland, reversing the action of the collector in assessing a 15 per cent duty as "rubber manufactures commonly known as druggists' sundries," and sustaining the claim of the importers for entry at 10 per cent as "manufactures of rubber not specially provided for."

AMERICAN INVESTMENTS IN MEXICO.

Marion Letcher, United States consul at Chihuahua, states that up to 1912, American investments in Mexico aggregated \$1,057,770,000. He credits \$15,000,000 of that amount to American capital invested in the rubber industry.

A MODEL TIRE PLANT OFFICE.

The Colorado Tire & Rubber Co., Denver, Colorado, has just completed plans, and will soon start building an addition to its present plant, at a cost of about \$12,000. This addition will be two stories high, of brick, as is the present factory. The enlargement is necessitated because of the heavy increase in demand for the company's "Durable" treads. The accompanying



picture shows the business office of the company, which, for systematic arrangement, and for the comfort and convenience of the workers, is worthy of study of details by every concern having a large office force. Such an office must naturally facilitate routine work and make for increased efficiency.

NEW PLANT FOR GOODYEAR IN TORONTO.

The new plant of the Goodyear Tire & Rubber Co., Limited, in New Toronto, Canada, mentioned in a former issue, will comprise a building for the manufacture of pneumatic tires, 100 by 500 feet, four stories and basement; a power plant, and a building for the manufacture of cement. C. H. Carlisle is treasurer and general manager. The present factory of this company is located at Bowmanville, Ontario, and when the new plant is completed the Bowmanville factory will be used exclusively for the manufacture of mechanical goods, carriage tires, motor truck tires and Neolin.

A NEW TIRE FACTORY AT SOUTH BEND.

The International India Rubber Corporation, incorporated under the laws of Delaware, October 29, 1915, with a capital stock of \$1,000,000, is to build a factory at South Bend, Indiana, for the manufacture of automobile tires and tubes and other rubber products.

The officers and directors are: Peter E. Studebaker, president; Edward H. Schwab, vice-president; Thomas W. Slick, treasurer; George W. Odell, secretary and general manager; William S. Moore, director.

Mr. Studebaker is the son of Henry Studebaker, who founded the Studebaker Brothers Wagon Co. in 1852. As soon as the plant is in operation, he will devote his entire time to the interests of the company.

Mr. Schwab is a manufacturer of spark plugs at Bethlehem, Pennsylvania, and is a brother of Charles M. Schwab, former president of the United States Steel Co.

Mr. Slick is a lawyer and was formerly president of the Chapin State Bank and director of the American Trust Co. and the Union Trust Co., and is interested heavily in real estate in South Bend, Elkhart and Gary.

Distributing branches are being established in various parts of the country by selling garage men and tire handlers small blocks of 7 per cent cumulative preferred stock.

NEW FIRESTONE BRANCHES.

A three-story building in Los Angeles, California, is soon to be erected by the Firestone Tire & Rubber Co., Akron, Ohio, to be used as a tire branch. An unusually attractive establishment is planned for this branch, the construction to be of the characteristic California mission style.

A new two-story structure is about to be started at Syracuse, New York, which will be used as a tire building for the Firestone company.

A branch has also been opened at Harrisburg, Pennsylvania, in a temporary location, and it is expected that a permanent location will soon be secured. L. L. McClintock is in charge of this branch.

A new direct factory branch at Springfield, Massachusetts, covers a space of 48 feet frontage and 32 feet depth, containing two private offices, one for use by the adjusters, and the other being the office of the branch manager, G. I. Engle. Equipped with a Syracuse press, and facilities to take care of all trucks, this branch will also carry a good supply of motor truck tires, pneumatic tires, bicycle tires, accessories, repair stock, rims and carriage tires. The territory embraces the State of Vermont; Cheshire and Sullivan counties in New Hampshire; and Berkshire, Hampden, Hampshire and Franklin counties in Massachusetts.

THE BRUNSWICKE-BALKE-COLLENDER CO.

The Brunswicke-Balke-Collender Co., Chicago, Illinois, maker of billiard tables, bowling alleys, etc., has entered the tire manufacturing field, and will manufacture automobile tires and inner tubes as side lines at its factory at Muskegon, Michigan. This company has also begun the manufacture of electric storage battery cells and other specialties in both hard and soft rubber.

HELPING THE CAUSE OF PREPAREDNESS.

The Norwalk Tire & Rubber Co., Norwalk, Connecticut, has offered to pay every factory employee who joins the training camp at Plattsburg this summer the difference between the wage he earns at camp and his regular wages, thus allowing every employee who goes to the Plattsburg camp to receive full pay. This is an especially generous concession in view of the fact that the rush of orders at the Norwalk company's factory is necessitating night and day work.

WILL BE RUNNING NEXT MONTH.

The plant of the Hawkeye Tire Co., Des Moines, Iowa, whose incorporation was noted in the June issue of THE INDIA RUBBER WORLD, embraces about 40,000 square feet of floor space. The



company expects to be turning out 100 tires per day by August 1, the maximum capacity being 400 tires per day. E. E. Harding, formerly of the Swinehart Tire & Rubber Co., and of the Knight Tire & Rubber Co., will be assistant general manager.

COMFORT AND BUSINESS.

Down in the busy business district of New York City one hardly expects to find such a home-like office as that occupied by R. J. Caldwell, of the company which bears his name, situated at 12 Park Row, corner of Broadway. Mr. Caldwell con-



trols the output of two large tire and mechanical fabric mills and is an important distributor of this product to the rubber trade. His office looks more like a library in a private residence, and shows evidence of the best of taste in furnishings. Mr. Caldwell believes that in these surroundings he is able to do more and better work than in the old-fashioned business office, and it certainly gives the visitor, whether calling on business or socially, a most home-like feeling which, in itself, is a welcome second only to Mr. Caldwell's own cordial greetings.

GOODRICH SERVICE STATIONS.

Recognizing the importance of Bangor, as a distributing center to the automobile tire and accessory trade, The B. F. Goodrich Co., Akron, Ohio, has opened a wholesale stock depot and dealers' service station at 7 Franklin street, Bangor, Maine. H. H. Baker will be in charge.

During the past month the Goodrich company has also established a similar station at 137 St. Paul street, Burlington, Vermont, under the management of L. E. Stone, and one at 243 North Sante Fe avenue, Salina, Kansas, in charge of L. K. Graham.

INSTALLS A RESEARCH DEPARTMENT.

The Polack Tyre & Rubber Co. is operating its factory at Bridgeport, Connecticut, on a 24-hour schedule. This company has recently added to its organization a scientific development department including a laboratory for routine testing and research work. This department is in charge of Webster Norris, one of the best known American rubber chemists.

BE SAW TIRE & RUBBER CO. SUCCEEDS QUALITY.

The Quality Tire & Rubber Co., Hartville, Ohio, has changed its name to the BeSaw Tire & Rubber Co. Charles BeSaw, the president and general manager, was formerly general superintendent of the Knight Tire & Rubber Co., of Canton, Ohio, and P. P. Parker, the sales manager, was formerly assistant sales manager for the latter concern. The BeSaw company is working its plant both day and night and turning out about 150 tires daily, one a high grade known as the "BeSaw Quality," and a low-priced tire in small sizes which has been named the "Blackford."

TRADE NOTES.

The following new agencies are reported by the Braender Rubber & Tire Co., Rutherford, New Jersey, manufacturer of Braender tires and tubes: American Motor & Equipment Co., 181 Massachusetts avenue, Boston, Massachusetts; The Kassler Motor Co., 5th and White streets, Dubuque, Iowa, and H. B. Herr, 30 West King street, Lancaster, Pennsylvania.

The capital stock of the Fisk Rubber Co., Chicopee Falls, Massachusetts, has been increased from \$14,400,000 to \$19,400,000.

The Kansas City Tire & Rubber Corporation, manufacturer of pneumatic and solid tires and tubes, was incorporated under the laws of New York, May 21, 1915, with a capital stock of \$575,000. The principal office of the company and one of its factories are in Kansas City, Kansas, another factory being located at Chester, West Virginia.

The Quaker City Rubber Co., Philadelphia, Pennsylvania, is building a one-story addition, 50 by 150 feet, to afford better facilities for handling its output of tires.

The Ajax Rubber Co., Inc., New York City, which distributed prizes for high mileage of its tires for the year ending March 31, 1916, is now offering \$5,000 in cash prizes in a similar contest now begun, and to continue until March 31, 1917. Two hundred and eight cash prizes are offered to chauffeurs. The judges of the contest are as follows: Alfred Reeves, general manager, National Automobile Chamber of Commerce; R. A. Patteson, president, Tarrytown (New York) National Bank; L. W. Scudder, certified public accountant, New York City.

The Keystone Tire & Rubber Co., New York City, has increased its capital from \$5,000 to \$500,000.

F. A. Skipworth, of Dallas, Texas, will handle the products of the Wilson Tire & Rubber Co., Springfield, Illinois, in the State of Texas. This is not a factory branch, as Mr. Skipworth is using his own capital.

The Boss Rubber Co., a tire distributing concern with headquarters in Denver, Colorado, has very recently opened a new store at Butte, Montana, which will be the distributing point for the state. The company is said to specialize in Kelly-Springfield tires.

The plant of the Beaver Tire & Rubber Co., Ashtabula, Ohio, is rapidly being pushed to completion. The company hopes to be on an operating basis shortly after August 1.

With a view to organizing the rubber industry of Los Angeles, California, as a unit in the chain of similar organizations throughout the United States to be affiliated with The Rubber Club of America, Inc., 15 leading members of the tire trade of that city recently met at luncheon for discussion of the plan.

Contracts for three new buildings will be given out by the Federal Rubber Co. of Cudahy, Wisconsin. When these are completed the company will have approximately 12 acres of floor space, and will allow facilities for a 50 per cent increase in the output of Federal products. The company is putting out a new line of black tread tires under the name "Traffic," made in non-skid and plain types.

The Valley Rubber Co., North Yakima, Washington, has recently installed a new 6-bar tube press, which greatly facilitates the treatment of inner tubes and saves delay on repair work.

Aeroplane cord tires, made with large cross sections to afford adequate cushioning properties, will probably be extensively used on American air craft in the future.

THE GOODWEAR TIRE CO. BUILDS.

The Goodwear Tire Co., Minneapolis, Minnesota, incorporated January 6, 1916, with a capital stock of \$300,000, is building a factory at Red Wing, Minnesota, 120 by 150 feet, two-story and basement, and a power plant, 60 by 50 feet. The plant will be equipped with the most up-to-date machinery obtainable and the company expects to begin operations by November with a production of 200 tires and tubes daily and a full mechanical line. The officers and directors are as follows: H. Scott Ewers, president; G. W. Franson, vice-president; Frank E. Oberg, secretary; C. W. Oberg, treasurer; Harry J. Smith, purchasing agent and factory manager.

ARMORED CAR FOR THE MARYLAND NATIONAL GUARD.

Rubber men all over the country are interesting themselves in the present Preparedness movement. The Maryland National Guard will have a first class armored car of the latest approved type if the plans of four Baltimore men prove successful. They are at this time endeavoring to raise the necessary funds through subscription, and a good start had already been made the latter part of June. At the head of the committee is George P. Thomas, 3d., of the Goodyear's Rubber House, Baltimore, of which his father, George P. Thomas, Jr., is principal. The other members of the committee are Addison de Goll, E. L. Bartlett, 3d., and Gordon T. Parks, the latter being treasurer.

THE NEW DREADNAUGHT COMPANY.

The Dreadnaught Tire and Rubber Co. of Maryland, incorporated under the laws of Maryland, has purchased the entire plant and assets of the old Dreadnaught Tire and Rubber Co. of Delaware, the new organization being completed and the plant at Orangeville, Maryland, ready to commence operations July 1. The general offices of the company are also located at the Orangeville plant.

The new company is capitalized at \$700,000, of which \$300,000 is preferred and \$400,000 common; nearly one-half has already been subscribed to. The officers are as follows: John Hiltz, president; John P. Lauber, vice-president; Wm. C. Schmeisser, treasurer; H. James Lepper, secretary, and W. V. Sleek, general manager. All of these men, with the exception of Mr. Sleek, are well-known Baltimore business men. Mr. Sleek has for the past four years been connected with the Mansfield Tire & Rubber Co., Mansfield, Ohio, as purchasing agent and efficiency engineer and for ten years previous, in executive capacities, with some of the largest motor car manufacturers.

CRUSADE AGAINST FRAUDULENT TIRE AND SUPPLY SCHEMES.

The American Automobile Association is conducting through its legislative committee a campaign against fraudulent schemes in the accessories field. Richard H. Lee, of Cleveland, Ohio, the chairman of this committee, is president of the Cleveland Automobile Association and the Ohio State Automobile Association. This crusade is directed against leagues and associations which promise standard automobile supplies and accessories at cut rates. Through the efforts of this committee two men pleaded guilty to fraud in St. Johns, New Brunswick, Canada: one man was arrested in Uniontown, Pennsylvania, and pleaded guilty to fraud; and a fourth was arrested in Valdosta, Georgia; and in Washington on June 24, the president of the International Automobile League was arrested at the close of his testimony before the solicitor-general of the Post Office Department, on an action brought to prevent the use of the mails by the league, which purports to supply its members with tires and auto accessories at greatly reduced prices to those who pay an annual fee of \$10 to join the organization. But it is claimed that members, who wrote for standard accessories and tires listed in the catalog, have been informed that they were "just out," and have been offered unnamed tires "manufactured by the concern exclusively" instead of those cataloged. When

complaints were made, it was pointed out that the contract with members provided that they would furnish the goods listed in the catalog, "when such goods are in stock." The legislative committee is to be congratulated on this outcome of its activities.

TIRES AT THE INDIANAPOLIS AUTOMOBILE SWEEPSTAKES.

The first three cars in the 300-mile automobile sweepstakes race at Indianapolis, May 30, were equipped with Goodrich Silvertown cord tires. The fourth and fifth cars used Firestone tires.

The leaders using the Silvertown tires covered the 300 miles with but one change each, while the Firestone tires completed the distance with four changes. Left front tires were unchanged, but several right front tires were blown, this tire being most dangerous of all and requiring most careful attention. Generally speaking, the tire changes were made often to insure safety. Tires were inflated to about 60 pounds, although some drivers inflated to 100 pounds, and then, before starting, let the pressure down to the required amount.

Many drivers used smaller tires in front than in rear on account of the strength required in steering with 5-inch tires.

One driver used a novel attachment for cooling his tires. Water was conducted from a special tank by pipes to each wheel, ending in spray nozzles. The apparatus worked by air pressure, the control-valve being operated by the mechanic.

T. G. RICHARDS BUYS THE B. & R. RUBBER CO. PLANT.

The plant of the B. & R. Rubber Co., North Brookfield, Massachusetts, which has been in the hands of the receivers, was advertised to be sold at public auction as a going concern in one lot, at a price of not less than \$265,000. The sale was to be on June 28, at the office on the premises, but was, on that date, postponed till June 29, when it was sold to Thomas G. Richards, who was president and treasurer of the B. & R. Rubber Co. According to the terms of the sale, the property is to be delivered within 15 days from the confirmation of the sale by the court.

A FIREMAN IN HIS YELLOW SLICKER.

A fire chief in one of the Southern cities recently took a newspaper man into his confidence relative to the yellow oil coats known as "slickers." When he joined the fire department his first act was to possess himself of one of these coats. Shortly after an alarm was sent in. The rest of the story can very properly be told in his own words:

"My, that was a hot fire! But when we got there it was supposed to be my job to be on the business end of the steamer line. I had on my pretty little yellow slicker and was a fit subject for a swell drawing room, and started with the captain of the company for the fire. By the time I got half way across the street that coat began to melt from the heat of the fire, and the liquid rubber began to run down my neck, raising a blister wherever it touched my then tender hide. I began to try to squirm out of it, and one of the boys pulling slack behind me thought I was trying to pull it further up on me, and he came to help. Great Caesar, the very thing I didn't want done was being done. I suppose we have all formed an idea of the inferno. I had mine before that, but let me tell you one thing, and you can take my word for it—my idea of the inferno before that man pulled that coat up on my neck and back would make the warm place an ice palace beside the new idea I formed from that experience.

"Yes, sir, I am 'agin' rubber coats to fight fire in and have been from that night."

This is an interesting story, and nobody can blame the chief for looking with marked disfavor on the yellow "slicker," but his description of it as a "rubber" coat is quite inaccurate, because there is no rubber in these yellow coats—they are waterproofed with boiled linseed oil, and, are they ever worn by firemen?

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

THE rubber companies of this city are responding generously to the call of patriotism in encouraging their employees to join the militia for Mexican service, by the practical expedient of insuring them against financial loss.

The B. F. Goodrich Co. has announced that to all employees who will serve in the militia who contribute to the support of dependents, two-thirds of their average wage, based on their previous average wage during the last three months, will be paid.

To all men not contributing regularly to dependents, one-half of their average wage will be paid.

Payment will be made direct to dependents designated or will be held in trust for the employee. Insurance issued by the company will remain in effect. The company also announces no discrimination will be made against the employee upon his return and he will return to his position if possible.

The Goodyear Tire & Rubber Co. encourages its employees to enlist in the national guard, allowing them the necessary time for summer military camp duty, without prejudicing their salaries or positions with the company. Many Goodyearites are affected by the President's mobilization order, among whom are executives and engineering experts whose services to the company are invaluable.

The Firestone Tire & Rubber Co. will give all employees enlisted on or prior to June 20, who have been in continuous service of the company three or more years, full wages less all money received from the State or National Government. Employees in continuous service of the company between one and three years, will receive two-thirds of wages less all money received from the State or National Government; and employees in continuous service of the company less than one year, one-half of wages less all money received from the State or National Government.

Employees who enlist after June 20, will be allowed wages as follows, less all money received from the State or National Government:

Those in continuous service of the company three or more years, full wages; those in continuous service between one and three years, two-thirds of wages; those in continuous service between six months and one year, one-half of wages. Those in continuous service less than six months will receive no allowance. The average wages earned per month for three months prior to enlistment will be the amount allowed piece workers, also employees on salary.

The Firestone Tire & Rubber Co. has just installed a turbine engine, capable of generating 12,000 horsepower. The new turbine replaces one of 3,000 horsepower.

That there is a growing interest in the popular mind as regards the rubber business is shown by the inquiries made to every rubber company for samples and particulars of manufacture by school principals and teachers. To meet this demand, the Firestone company has prepared an exhibit of the chief commercial rubbers and has sent out several hundred such exhibits to the various schools and colleges, together with a booklet which explains processes of manufacturing the various articles.

On June 17, the power house of the Firestone company was partially destroyed by fire, caused by defective insulation. While the fire was confined to the power plant, the damage done was of a character to affect general operation, though all departments are now restored to normal operating condition.

A. H. Harris has sold to the Firestone company his patents on the machine and method used in making cord tires. This machine was illustrated and described in THE INDIA RUBBER WORLD, January 1, 1916.

Mention was made in the June letter of the appointment of a meeting of stockholders to increase the capital stock of the Miller

Rubber Co. and to distribute shares to the common stockholders. The meeting was duly held on June 2 and the capital stock of the company was increased from \$2,000,000 to \$20,000,000, divided into 200,000 shares of \$100 each, of which amount of stock \$10,500,000 par value, consisting of 105,000 shares of \$100 each, shall be preferred stock, and \$9,500,000, consisting of 95,000 shares of \$100 each, shall be common stock.

The Miller company is to be congratulated on the present condition of its business. It is stated that for the past six months of the present fiscal year the sales were 100 per cent in excess of the same period last year. The gross sales from October 2, 1915, to April 1, 1916, were about \$2,000,000, compared with \$800,000 for the same period the previous year. A portion of the proceeds of the sale of \$2,500,000 worth of preferred stock is to provide for factory additions now in process of erection and for the retirement of old preferred stock. The company is erecting two six-story buildings and two eight-story buildings which, when completed, will make the total floor area over 21 acres.

The advertising department of the Miller company is sending to dealers handling its tires electrotype advertisements for inserting in the local papers which are distinctly novel. Each one is adorned with a figure named "Mr. Quick Service," the word "Quick" being used to form the principal features of this supposititious person. He is crowned by a cap made from a Miller tire and he is represented as being on the spot to do every sort of tire and tube repairing. The ingenious artist has evolved a figure which is decidedly noticeable, though it can hardly be called handsome, but that it will be quickly recognized if given sufficient publicity goes without saying.

* * *

At a director's meeting of the Portage Rubber Co., at Barberton, held on May 29, the regular quarterly dividend of 1 1/4 per cent upon its issued and outstanding preferred capital stock was declared, payable July 1 to stockholders of record June 20; also a quarterly dividend of 2 per cent on its issued and outstanding common stock, payable August 15 to common stockholders of record August 5.

The Portage company will hold a stockholders' meeting on July 11 to vote on a plan to increase the capital stock of the company from \$1,250,000 to \$3,000,000. Half the new stock is to be common, and shareholders will be offered the right to buy new stock at 105. The issue has already been underwritten.

* * *

The Functureless Auto Tire Co., manufacturer of the King tubeless truck tire, has recently purchased a 20-acre tract of land just south of the Barberton pumping station, with a frontage of 1,864 feet on the Pennsylvania, Erie and B. & O. tracks on the north; Mud Run on the east; the Ohio canal on the south, and 364 feet of public highway. A factory will be built at once, comprising four main buildings, 80 by 400 feet, four stories high, with a power and rim plant. A temporary building will be erected for immediate production.

* * *

The Double Service Tire & Rubber Co. has purchased the plant of the Lily Rubber Co. at Barberton, comprising 4 1/2 acres of ground. For the present, the buildings now on the property will be used, but a new, modern tire factory will be erected in the near future on this site.

* * *

The Goodyear Tire & Rubber Co. recently presented to the Ohio National Guard, through Battery B, largely composed of Goodyear employees, a fully equipped military "kite" balloon, made under the direction of Sergeant R. H. Upson, the Goodyear aeronautical expert.

The kite balloon is a type of balloon developed by foreign governments for use in making military observations. It takes its name from the manner of rigging, which is similar to a

boy's kite, being held at an angle from horizontal so that the wind helps to hold it steadily in suspension. Experiments at the Goodyear Tire & Rubber Co. factory have developed a balloon which it is claimed can be operated in any weather conditions, and will not pitch, roll nor yaw even in a stiff gale. The new balloon is 81 feet long and 22 feet in its largest diameter. Hydrogen gas is used for inflating. The method of rigging is readily shown in the picture, taken during the test



last month which was conducted under the observation of representatives from two foreign governments, and one each from the United States Army and Navy, and pronounced satisfactory.

The use of an automobile for holding the balloon was a novel proceeding. The "kite string" was a wire cable. This was passed over a drum, and power was transmitted to the drum from the driving wheel of the automobile, thus allowing the balloon to be raised or lowered as desired, an experiment found to be fully successful.

It is claimed that in 1907 the Goodyear Tire & Rubber Co. made 28,685 tires; that this year it will make more than 3,000,000, and that in 1917 the output of Goodyear tires will exceed 5,000,000.

To make a larger area available as a site for the Goodyear company's new mechanical goods and chemical plants, a new channel is being excavated for the Little Cuyahoga River, incidentally shortening its course.

The third smoke-stack of the Goodyear company, which was recently completed, is the highest in the State, and required 1,585 tons of brick in its construction. It is 21 feet 6 inches in diameter at the top, which is 250 feet above floor level. On June 22, the Goodyear company set a new record in tire production by turning out in 24 hours 28,499 tires.

A delegation of the American Association of Chemical Engineers recently were shown through the factory of The B. F. Goodrich Co., and subsequently entertained at luncheon at the Portage Country Club, Akron, Ohio.

Garth A. Dodge, one of the well-known rubber engineers of Akron, and a member of the American Society of Automobile Engineers, has recently accepted the position of factory manager and mechanical engineer with The Dayton Rubber Manufacturing Co., Dayton, Ohio.

A. J. Bethea, a chemist of experience schooled in the Akron plants, has also joined the staff of the Dayton company.

* * *

Among the recent visitors to Akron well known in rubber and allied lines were: William D. Anderson, Bibb Manufacturing Co., Macon, Georgia; R. P. M. Eagles, Taylor Armitage & Co., New York City; F. H. Peaty, H. A. Astlett & Co., New York City; Merton A. Turner, Monaquot Rubber Works Co., South Braintree, Massachusetts, and Thomas Midgley, The Interlock Core Co., Columbus, Ohio.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

REGARDING the rubber trade generally, I find no one complaining very greatly of dull times. To be sure, some lines are in more demand than others, but all are having a pretty fair call. Manufacturers of automobile tires report a better call than last month, and this is but natural, for as the season proceeds more machines are going into use, and those already in use are wearing out tires, thus there is both a manufacturer's and a consumer's demand. This has been a record season in rubber footwear and the demand for tennis goods has been wonderfully expanded. Just now jobbers are sending in additional and duplicate orders for rubber footwear, the time limit for the extra discount allowed by some companies expiring July 1. In mechanicals the call continues to increase for belting, this because of the continued high price of leather. But this is to some extent balanced by the small demand on the manufacturers for garden hose, owing in great measure to the backward spring and the large amount of rain which has fallen during the last two months. The rubber clothing business, in the retail trade, at least, has been exceptionally good, owing to the aforesaid rainy weather. Manufacturers have more orders for waterproofed garments than they have ever had at this time, and some are making preparations to increase their output. Taken altogether, the rubber trade in this section is in a most satisfactory condition.

* * *

Like all other sections of the country, the Massachusetts militia responded quickly to the call of the President and at this writing are already on their way to the Texas border. And here, in the emergency, the Forsyth Dental Infirmary for Children offered its services to treat free the dental needs of those who were going into military service. The infirmary, which was intended for free service for children only, was enabled in the short time between the call to arms and the departure of the troops, to give several hundred treatments, the 65 chairs being continuously occupied during Saturday and Sunday, June 24 and 25, and even a portion of Monday, the day when the companies departed for the South. Here is another example of the public benefaction of the president of the Boston Belting Co., and as a side thought, a tribute to his ingenuity, for it was through his insistence, and his own suggestions and designs, that the chairs in the infirmary, though made primarily to accommodate children, were so adjustable that they could be used, while being treated, by the troopers of all dimensions and weights. Adjutant-General Cole and Mayor Curley have both sent their thanks to Thomas A. Forsyth and Superintendent Dr. W. H. D. Cross for this timely assistance. And it might be added that Dr. George A. Sullivan, of the Carney Hospital Clinic, and 20 dental assistants went immediately to Camp Whitney to do similar work for other soldiers there.

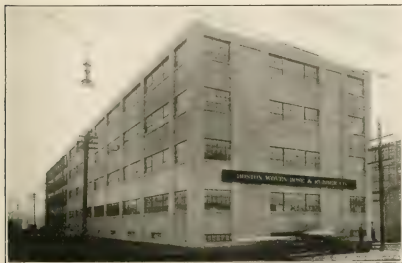
* * *

The Pennsylvania Rubber Co.'s Boston store has been moved from Boylston street to the new Lewis building at 683 Beacon street. This move is an important one, as it brings the company's headquarters right into the heart of Boston's automobile district, which will undoubtedly redound to the material benefit of the sale of the Pennsylvania company's well-known tires.

The Davidson Rubber Co. has recently sold to the De Vilbiss Manufacturing Co., Toledo, Ohio, a portion of its hard rubber equipment, and it was reported that the Davidson company was about to retire from hard rubber manufacture and use the space formerly devoted to this branch for the development of soft rubber specialties. I am in a position to contradict this story. The only equipment which the Davidson company has sold is that pertaining to the manufacture of hard rubber parts for atomizers. Aside from that, the Davidson company's hard rubber department will continue as usual.

* * *

Mention was made in my letter last month of the completion of new buildings of the Boston Woven Hose & Rubber Co., and I am sending you a photograph of one of the new buildings in order to show their character and stability. This is the smaller of the recently added buildings, measuring 155 by 60 feet. Like



the others, it is of reinforced concrete construction. This structure will be used mainly for storage purposes, although one floor will be devoted to the comfort and convenience of the employees during their noon hour, tables being provided for those who bring their lunch, while a lunch counter will be established where food will be furnished practically at cost. There will be facilities also for entertainment, thus adding to the welfare work already established by the company. A similar building just completed is used for a machine shop, the manufacture of garden hose, and for storage. This is also 60 feet wide and more than 200 feet long, and is provided with a traveling crane in the center bay which extends the full length of the building. The company has just broken ground for another building, 165 by 60 feet, four stories, also of this same solid concrete construction, which building will be used to extend the manufacture of friction tape, rubberized fabrics, etc.

* * *

The strike at the Revere Rubber Co. factory at Chelsea has now lasted a month, with prospects of a long continuance. The strikers demand a nine-hour day and 50 hours a week for men, and a 48-hour week for women, as well as an increase on piece-work basis. At a conference between the strike committee and Superintendent Scribner on the 19th of June no agreement was reached. In an interview, Mr. Scribner said he has only the kindest feeling for the men, that he regrets the continuance of the strike, but sees no prospect of an early settlement.

* * *

The Standard Woven Fabric Co., manufacturer of "Multi-bestos" products and rubber specialties, is installing new equipment and making important changes in the plant at Walpole which it recently purchased. This will give the company a much needed addition to its present facilities for the manufacture of clutch linings which is now being carried on at the plant at Framingham. The business of this company has been so important and so pressing as to necessitate working upon a day and night schedule, but it is hoped that as soon as enough

machinery is installed at Walpole, it will be possible to discontinue production at Framingham, and to move the whole equipment from there to the newly acquired property at Walpole. In this connection the company will develop a business in friction and insulating tapes for the electrical trade, the Walpole property being particularly adapted for this line of manufacture. The company has closed a contract to manufacture rubber heels for the Panther Rubber Co., Stoughton. It is reported that the contract calls for a maximum output of 100 gross per day, and the company has already started on this work.

* * *

Everett Morss, president of the Simplex Wire & Cable Co., of this city, which has had a successful profit-sharing plan in operation for 15 years, is scheduled to speak at the Third Annual Babson Conference on Cooperation at Wellesley Hills, Massachusetts, in September. Vice-Chairman Edward N. Hurley, of the Federal Trade Commission, has also accepted an invitation to speak, and others who are interested in profit-sharing are expected. Mr. Morss's address last year excited keen interest on account of the simplicity and directness of his ideas on profit-sharing.

* * *

The F. S. Carr Co., of this city, has removed its Canadian factory from Tilbury, Ontario, to Granby, Quebec, where it has bought the premises formerly occupied by the Walpole Rubber Co. This is a five-story brick main factory and a brick cement mixing building, and is in every respect an up-to-date establishment. The Carr company will manufacture a line of rubber heels and shoe factory supplies, automobile fabrics, rubber sheetings and hospital supplies. This, of course, is an auxiliary factory for supplying Canadian trade. No change will be made in the Framingham, Massachusetts, plant. The Canadian factory is in charge of P. G. Dunham, who went to Granby seven years ago, and organized and managed the Walpole company's factory there, and later assumed the supervision of the Walpole, Massachusetts, plant, resigning two years ago to take charge of the Carr company's Canadian business.

* * *

The new mill of the American Tire Fabric Co.'s plant in Newburyport is now nearly completed and equipment is soon to be installed. It is a brick structure, 186 feet long and from 20 to 64 feet wide. This concern is a successor to the American Textile Co. It is expected to give employment to about 80 hands at the start.

* * *

At the National Shoe and Leather Market-Fair, which is to be held in this city the week of July 12 to 19, the following manufacturers will exhibit: Panther Rubber Co., Essex Rubber Co., Federal Rubber Co., The B. F. Goodrich Co., Avon Sole Co., Revere Rubber Co., Goodyear Tire & Rubber Co. All of these are manufacturers of rubber soles and heels, but only one manufactures boots and shoes. This might seem strange at first thought, but practically the season's business in rubber footwear has already been placed and this may be the reason why none of the other rubber boot and shoe manufacturers have thought it expedient to make exhibits.

* * *

Hudson, Massachusetts, holds its fiftieth anniversary of incorporation as a town the second, third and fourth of this month and there will be a general celebration appropriate to the Fourth of July, and also an industrial exhibit at the Armory, of goods manufactured in Hudson. The Apsley Rubber Co. will show a full line of all its different styles of goods, and will have in operation machinery for manufacturing. Operatives will show the making of boots and shoes and rubber clothing. Hudson was named for the only member of Congress elected from that place previous to its date of incorporation and the only other member of Congress from that town is the Hon L. D. Apsley, who will deliver an address on this occasion.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE several rubber manufacturing plants throughout Rhode Island continue to be rushed with work, practically all lines being pushed to capacity. Notwithstanding the long period of unprecedented activity every indication, according to those in close touch with affairs in general, is that this condition may be expected to continue for many months, at least. One of the gravest problems confronting the various plants is the shortage of help, although all of the concerns are paying a higher wage scale than ever before in order to secure workers. Orders for immediate delivery are plentiful, with additional requisitions for future shipment being received daily.

The wire-insulating department of the National India Rubber Co., Bristol, resumed operations May 31 after a shutdown from the 27th for the purpose of taking an inventory.

The work of enlarging the vulcanizing department at the plant of the National company is rapidly nearing completion. With the completion of the new buildings at the west end of the company's plant, the National will have one of the largest and most thoroughly equipped vulcanizing departments in the country.

The election of George Schlosser as vice-president of the National India Rubber Co., and his taking charge of the Woonsocket and Millville plants, has necessitated numerous changes and promotions in the executive staffs of these plants, in order that Mr. Schlosser may have more time for his managerial responsibilities. Among these changes is the promotion of Superintendent Henry C. Wagner to the position of factory manager of the plants at Woonsocket and Millville. Herman Fahrenholz, who has had general oversight of the manufacturing end of the Alice mill at Woonsocket, has been made superintendent and William H. Schlosser, who has been in charge of the Alice mill calendaring room, has been made assistant superintendent. Waldo E. Kelly, who has been chief clerk and purchasing agent at the Alice mill, has been appointed secretary to the manager.

James W. Franklin has been appointed superintendent of the footwear department, and Frederick L. Dunbar, superintendent of the wire insulating department. Both were assistant superintendents. Edward L. Cooper, who has been connected with the plant for several years, has been appointed overseer of the packing division of the shoe department.

A gold watch and chain were presented to Cornelius J. Gallagher on June 17 by the employees of the packing department of the National India Rubber Co., of which he had been in charge for several years. The presentation was made by Superintendent James W. Franklin. Mr. Gallagher severed his connection with the company that afternoon to take up another line of business.

Colonel Samuel P. Colt, president of the United States Rubber Co., with nearly a score of guests, left on the morning of June 3 for his camp in Maine, where they remained for a fortnight. This camp is located on a chain of lakes at the base of Mount Katahdin, about 35 miles up the Penobscot river from Norcross, Maine, and the trip from Norcross is made in canoes. Trout, bass and other fish abound in these lakes and furnished the party excellent sport during their stay.

The Colonel's guests were Nathaniel Myers, Walter S. Ballou, Mrs. Imogene S. Waldron, Colonel and Mrs. Harold J. Gross, Mrs. Florence Beresford, Rev. George L. Locke, D. D., Countess Eleanor Moroni, E. A. Barrows, Mr. and Mrs. Wallis E. Howe, United States Senator LeBaron B.

Colt, Dr. Calvin S. May, S. X. Constantinidi and Ernest Hopkinson.

The joint standing committee of the fire department of the Woonsocket city council has awarded a contract for 1,000 feet of hose to the Gutta Percha & Rubber Manufacturing Co., of Boston. There were eleven firms that submitted bids.

The Board of Aldermen of Newport has awarded contracts for 2½-inch fire hose to J. T. O'Connell (Bay State Rubber Co.) and K. Postel (The B. F. Goodrich Co.) for 500 feet each, at 80 cents.

The Phillips Insulated Wire Co., of Pawtucket, has been authorized to increase its capital stock from time to time by vote of the directors to an amount not exceeding \$2,500,000. All shares are to be common of \$100 par value.

Large shipments by both freight and express have been made almost daily during the past few weeks from the Millville plant of the Woonsocket Rubber Co. Extensive improvements are in course of construction, a new concrete driveway of considerable proportions having recently been completed.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

THE Trenton Chamber of Commerce is planning for a permanent exhibit of goods made in Trenton factories. If the plan is carried out there will be considerable space devoted to the products of rubber mills. The plan of the organization is to acquire a building in a central part of the city for meeting quarters, with space for the exhibit on the ground floor.

The Empire Rubber Manufacturing Co. is erecting a \$2,000 addition to its plant.

General C. Edward Murray, of the Empire company, has been publicly complimented by Governor Fielder for his prompt and efficient work as Quartermaster General when the recent call was received for the mobilization of the New Jersey National Guard. General Murray had planned to leave Trenton shortly with his family for an extended cruise on his yacht, to various places of interest on the great lakes.

The Thermoid Rubber Co. has given out a contract for an addition to the plant to cost \$18,000. It is to be two stories high and absolutely fire proof and will be used as a vulcanizing department.

The Three Star Tire Co. is to have spacious salesrooms in a new garage to be erected on North Montgomery street.

Richard Barlow, proprietor of Barlow's Hotel, in this city and a member of the De Lion Tire and Rubber Co., died recently at the home of his daughter in Ohio. Mr. Barlow, who lived in Ohio before settling in Trenton, was buried in that state.

According to printed reports the American Tire Sales Co. of Washington, D. C., planned to take over the plant of the Mecca Tire Co. on June 15. This report could not be verified in Trenton as none of the interested parties live here. THE INDIA RUBBER WORLD correspondent visited the plant after the date mentioned, but there was no sign of activity about the place. It is said the office furniture of the Mecca company has been removed, as well as some of the stock.

KEEPING EMPLOYEES CONTENTED.

By Ernest A. Desch.

IT is difficult to keep employees who work in outlying districts thoroughly contented, for the call of the city is strong. It is possible, however, to curb this desire somewhat by entertaining the workers with motion pictures, a method that the Beacon Falls Rubber Shoe Co., Beacon Falls, Connecticut, has found highly satisfactory. The theater is the only one in the village, has seating accommodation for 400, and standing room for an additional hundred. Only the men and women employed at the plant and their families are admitted. The building, constructed of stucco, is equipped with two projection machines, in order to present feature productions without an intermission at the end of every reel.

Photoplays are the same, whether shown at the most pretentious theater in New York or at the smallest hamlet. There is no such thing as a Number One Company, the only difference being that some of those presented may not be in perfect condition, though still capable of giving satisfaction.

The first thing needed for a moving-picture show is an adaptable building. In the early days of the film industry the exhibitor usually did business in a converted store. Since that time the authorities have become far more strict and the public much more fastidious, consequently the modern exhibitor has had to erect a pretentious building in its stead. As a result makeshifts are not so general.

But the position of an operator in a manufacturing plant is entirely different from that of a proprietor of a picture house in the city. The employees will not protest, because they do not view photoplays under such perfect conditions as prevail in the towns and cities.

In selecting an existing building on the plant which can be remodeled into a passable photoplay theater, the following points should be borne in mind: The room should be lofty, well-ventilated and large enough to accommodate all the employees and their families. It should also be free of obstructions in the way of pillars and other supports, and should, moreover, be situated on the ground floor.

If the building is constructed of wood, this does not make it wholly unsuitable; but to make it safe, plastered metal laths or wire mesh should cover the walls and ceilings.

There should be at least four exits, which must open outward. It is advisable to divide the rows of seats into sections so as to provide for an aisle on each side, not less than three feet wide.

Chairs or benches should be fastened to the floor because if a fire occurs the seats will be overthrown and will interfere with the orderly egress of the crowd. It is customary in the design of such buildings to allow each spectator four and a half square feet of floor space.

The projection machine will cost from \$250 to \$300, according to make selected. The best standard makes include: The Simplex, which has many pleasing features in its construction, simplicity and safety being its outstanding points. The price is \$300. The Motiograph is also popular, owing to its durability and guarantee given by its manufacturers. The Edison Kinetoscope may be recommended because it is easy to manipulate with little experience and stands hard wear. There are two models, one priced at \$155 and the other at \$250. The Edengraph excels in that it produces perfect projection when operated by an experienced operator, and possesses several improvements not contained in other machines. The selling price is \$250. The distinguishing feature about the Cameragraph No. 6a is that a special device lessens the danger from fire. This costs \$250.

The authorities insist that the projection machine be enclosed in a fireproof booth, so that if there is an outbreak of fire, it cannot spread beyond. Here an expense of \$65 is involved, but it is worth it in the interests of safety. The booth, made of galvanized iron, is shipped in sections which are easily put

together by means of bolts and nuts provided for that purpose.

In the days gone by a bed sheet or a table cloth has been used as a screen, but science has come to the rescue, and now there are screens and screens. To obtain the best results it will be necessary to pay about \$1.50 per square foot for the materials used for that purpose.

The light by which to throw the pictures on the screen is usually obtained from an electric power plant. Failing this, a calcium gas-making outfit can be secured for \$35; the gas can be manufactured at five minutes' notice and gives a 700-candle-power light.

In selecting suitable lens for the projection machine, the size of room, make of projection machine, the length and height of screen and distance from the booth must be taken into consideration. It is false economy to purchase a cheap lens, and the



MOTION PICTURE THEATER BUILT BY THE BEACON FALLS RUBBER SHOE CO.

foregoing particulars should be furnished to the supply firm at the time of ordering.

Carbons are needed to run the projector. A case containing 1,000 costs from \$17 to \$45, according to market conditions.

A reliable operator will also be required. To obtain the services of one on full time will cost from \$20 to \$30 per week, but as he will only be on the job in the evenings, and then perhaps not every night in the week, it might be possible to arrange with someone on the staff, who has a practical knowledge of electricity, to undertake the work, and who would be paid, of course, for the additional time occupied by the work.

The operator will need a tool outfit, which should include cement for mending broken films, a file for sharpening carbons, lugs, reels and machine oil.

The average feature, at first, commands from \$50 to \$100 per day, but the price eventually drops to \$10. But this type of production provides a whole evening's entertainment. As four single reels may be rented for \$1.50 and upward, one is apt to decide in favor of the latter. It will be best to give both forms of entertainment a fair trial in order to determine which gives the most satisfaction.

The reels are rented from the nearest film exchange. It is customary to contract for a service and pay a week in advance. After this, the weekly requirements can be mailed, telephoned or telegraphed to the branch house and the films are despatched as required.

This plan of providing modern entertainment for employees is being considered by other prominent rubber manufacturing concerns in connection with their welfare work already under way.

METHODS OF TESTING COTTON FABRICS AND RUBBER PRODUCTS.

COMMITTEE D-13 of the American Society for Testing Materials presented tentative methods of tests for consideration at the annual meeting held at Atlantic City, New Jersey, June 27-30.

TESTING COTTON FABRICS.

The tentative tests for automobile tire fabrics submitted last year by the committee have been amended and continued as "Tentative General Methods for Testing Cotton Fabrics."

The new features included are:

1. Definition of "Dry Condition" and "Standard Condition" with respect to moisture.
2. Method of determining the thickness of the fabric.
3. Two alternate methods, designated as "grip" and "grab," for determination of tensile strength.

DEFINITION OF MOISTURE.

DRY CONDITION. The dry condition of cotton material shall be understood to be absolute dryness obtained by material placed in a ventilated drying oven maintained at a temperature of 221 to 230 degrees F., and dried to constant weight as determined by two consecutive weighings not less than ten minutes apart, and showing a further loss of not more than 0.1 per cent of the previous weighing.

STANDARD CONDITION. The standard condition of cotton material shall be understood to be the condition in which it contains 8.5 per cent of its dry weight of moisture.

THICKNESS OF FABRIC.

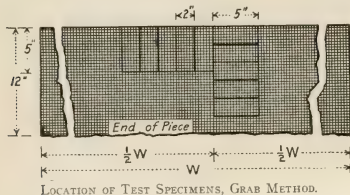
The thickness shall be measured by an automatic spring micrometer which presses upon at least 0.5 square inch of the fabric with a uniform constant pressure, and which is so mounted as to make measurements 6 inches from the selvage.

At least 10 measurements at different portions of the roll or piece shall be made, and the average shall be the thickness of the fabric.

TENSILE STRENGTH TESTS.

STRIP METHOD OF TEST. The test pieces of fabric are taken as shown in THE INDIA RUBBER WORLD (August, 1915, page 612), and are ravelled to the specified threads per inch.

GRIP METHOD OF TEST. The test specimens shall be taken as follows: Starting at a line in the center, warpside, lay off



adjacent to this line five specimens on one side, parallel to the line (warp) and five specimens on the other side perpendicular to the line (filling). The test specimens shall be cut 5 inches long by 2 inches wide. The specimens are not reduced in width by raveling, but are broken in a clamp that grips 1 inch width.

Where material requires special treatment, the committee intends to prescribe specific methods and tests which will be given precedence over the general methods. Two such tests have been prepared, one for automobile tire fabrics and the other for hose and belting duck.

AUTOMOBILE TIRE FABRICS.

The count per inch is determined by aid of the count scale

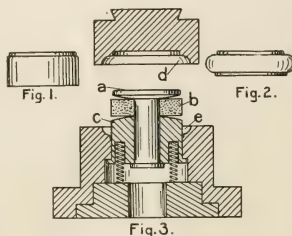
shown in THE INDIA RUBBER WORLD (August, 1915, page 612), and the strength determined by the "Strip Method" in the "Dry Condition" mentioned above.

FABRICS FOR HOSE AND BELTING.

The use of the "General Tentative Methods" is required, with the special requirement that the strength shall be determined by the "Grab Method," and the specimens, when tested, shall be at standard condition as defined above.

RUBBER EXPANSION MOLD IN METAL SHAPING.

The elasticity of rubber is utilized in shaping sheet metal objects in the die press. The operation of drawing or forming is a simple matter where the shape of the piece is such that it will clear the dies, and may be readily removed after



forming. Many styles of brass bed ornaments, alarm clock and cheap watch cases, parts of gas and electric fixtures, however, are of such shape that the opening is smaller than the main diameter of the piece. Such articles are first drawn in the form of a shell, and then shaped by an expanding portion, made of rubber. Such an operation is here illustrated. Figure 1 shows a shell of metal. Figure 2 shows the same shell, after being expanded in the dies shown in Figure 3.

The shell is placed in the die surrounding the upper plunger a, the rubber washer b, and the upper part of the lower plunger c. The punch, or upper die d is then brought down by the action of the press. The lower plunger c descends against the pressure of the two coiled springs until it strikes the bed plate and can go no further. As the descent of the punch d continues beyond this point, the plunger a is forced down against the rubber cushion b. This action causes the cushion to expand laterally, thus forcing the shell to fill the annular space formed when the punch d has descended to e.

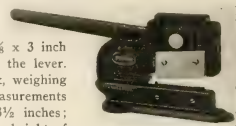
Upon the rising of the punch the coiled springs and rubber washer resume their original form, and the finished piece, Figure 2, is removed.

The rubber for this work must be of a quality which will stand a very considerable distortion without breaking, but sufficiently tough so as not to wear out too rapidly.

BRAKE LINING CUTTER.

This is a small, compact, hand-operated machine of great strength, constructed to accurately cut brake linings with ease and despatch. The eccentric device that operates the shear blade requires very little effort to cut $\frac{3}{4}$ x 3 inch lining with one stroke of the lever.

The machine is compact, weighing only 17 pounds. The measurements are: Length of blades, $3\frac{1}{2}$ inches; length of bed, $10\frac{1}{2}$ inches; height of bed, 6 inches; length over all, including lever, 18 inches. It is intended to be attached to a bench or convenient table. [The Peck Stow & Wilcox Co., Cleveland, Ohio.]



THE UNIVERSALITY OF THE RUBBER HEEL.

THE nerve-relieving quality of the jarless rubber heel has received world-wide recognition; and in frugal countries, where economy is a prime consideration, the demand for rubber heels on that score has constantly increased. It is safe to say that rubber heels of one variety or another are worn today in practically every civilized country, one style being particularly popular in one quarter of the globe and another, perhaps totally different, being preferred somewhere else. For instance, in the United States there are comparatively few revolving rubber heels worn. While the rubber heel in this country has long enjoyed a considerable vogue, it is almost invariably the solid rubber heel having practically the same shape as the leather heel it displaces and being quite as immovable. But in many other countries the revolving heel that permits the wearer, by changing the position of the heel from time to time, to get the maximum amount of service, is held in high esteem. The following brief review of the trade and varying tastes in rubber heels, in certain selected districts, may be of interest.

In England, according to reports, the solid heel is very little worn, and the revolving heel has also lost favor. But quarter tips, which are applied to that part of the heel that first strikes the ground in walking, are very generally affected.

In France, high-quality heels are most in demand, the circular heel, turning freely, being the only kind used. In Havre there is an extensive trade in these heels. A practical two-part heel has been put on the market, having a section attached immovably to the heel of the shoe, and a circle of rubber fitting into it and turning freely, both being of the same material.

In the principal cities of Bohemia—Prague, Pilsen and Budweis—the use of rubber heels has become general, and it is reported that in other towns and villages in Austria the demand for them is growing. Low-quality heels of reclaimed rubber, although stiffer and less elastic than those made of new rubber, are in greater demand because of the difference in price. Almost all the rubber heels used in this country are manufactured in Vienna. Of course, the continuance of war and the increasing scarcity of rubber greatly lessens the present use of rubber heels of any variety throughout Austria and Germany.

The two styles of rubber heels most popular in Spain are of German and American make. The American heels—bought from a leather house in Madrid—are the best wearing on the market, yet it is said that before the outbreak of the war their sale was exceeded twice over by those of the Germans. In Almeria round rubber heels are worn extensively. They are fastened with a single screw and may be revolved when one point is worn. The stock is drawn mainly from Barcelona through agents in that city of German and British manufacturers, and the selling price is nearly double the purchase price.

In Basel, Switzerland, the rubber heel is popular, especially with the middle classes, who conserve the life of the shoes by heavy leather soles, and heels reinforced with rubber. The heel-shaped rubbers with leather inlay are the most used, the heel being fastened on by wooden pegs driven through the leather inlay. They also use the rubber-edge, covering only the portion of the heel most exposed to wear, and the round, metal-cross-center rubber heel.

In the larger cities of the Union of South Africa rubber heels are worn by a majority of the population, the round and square heels having the greatest sale in the district of Johannesburg. Buying through local agencies is preferred, and the establishment of American agencies in this district is recommended by the local consul.

In the island of Jamaica it is estimated that about one-tenth of the population wear rubber heels. The round heels and those shaped to fit the latest style shoes are most in demand. Buying is done direct from the manufacturers or through New York commission houses.

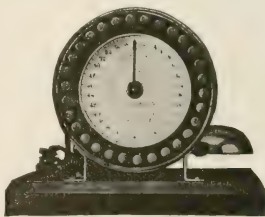
An importer in Rosario, Argentina, who has handled a variety of heels, now imports almost exclusively a high-grade American make which he sells to retailers at \$3.82 per dozen pairs.

A SPANISH RUBBER-SOLED SHOE.

The fame of THE INDIA RUBBER WORLD is exemplified when a shoe manufacturer in Spain, and 30 miles from a railroad, sends here a sample of his work for examination. Armando Fernandez has had excellent results with a rubber sole, claimed to be made entirely from reclaimed rubber from automobile tires, and this sole is so firmly attached to the leather upper that even on the cobblestone pavements of Cordova it has shown no signs of separation until worn out. The maker claims it will wear three times as long as a leather sole. His method of fastening to the welt is by the usual machine or hand sewing, the first layer of rubber being less than one-eighth of an inch in thickness, and to this is cemented a second layer which covers the stitches. The heel is built up of lifts, the outer layer of the sole continuing along the shank, down the breast of the heel and folding over to form the top lift. The sole and heel are deeply scored by diagonal lines forming diamond studs. It is said that the French Government has found these so durable that after a trial, an order was given for 700,000 pairs through the Parisian agent, Ricardo Vazquez. Certainly this Spanish inventor has produced a wonderfully fine piece of rubber if, as he claims, it is made from automobile casings, though from its red color it may have been made entirely from inner tubes; and his method of attaching seems to have some points which might be worthy of emulation by American manufacturers.

AN INTERVAL TIMER.

Small rubber articles, such as rubber heels—usually called mechanical rubber goods—are made in metal molds, and subsequently cured in a steam-heated press vulcanizer for a certain



period of time. The old way was to chalk down on some post or convenient surface of the press, the time to take the molds out of the vulcanizer. The inevitable results were the loss of considerable time through the necessity of constantly watching the clock and the production of overcured

goods caused by negligence on the part of the forgetful operator.

The Acme Interval Timer is a specially constructed clock, operated by electricity, and would appear to be almost infallible. It is extremely easy to operate as the following directions indicate: Note the position of the dial hand when the mold is put in the press, or if more convenient turn the hand forward to the zero position shown in the illustration. Press the button opposite the numerals representing the number of minutes desired for the cure. When the time has expired the bell will ring—then pull the button out as far as it will go. Thus any number of cures, up to thirty, can be taken care of at the same time. [Acme Supply Co., Ionia, Michigan.]

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

WITH the passing of the Compulsory Service Bill for married men the question of labor in rubber works has now reached an acute stage and many small manufacturers are at their wits' end how to carry on. Unlike banks and business houses, generally, rubber works have long been accustomed to employ female labor for tasks for which it has been found adequate and suitable, and the managers know better to what extent it is possible or advisable to replace men to a greater extent by women, than do the official compilers of a detailed list of occupations in which further substitution is recommended. For instance, it is difficult to find any approval in the trade for the proposal that women might be substituted for men on heavy machinery such as washers, mixers and calenders, and it will more likely result, in the case of small works, where the mixers have gone, that their work will be abandoned for the time being. Certain relaxations of the Factory Acts, especially with regard to the employment of women, have been officially granted and, in fact, every encouragement is being given to manufacturers to get along as best they can under the altered conditions. Of course there is no shortage of materials, and consequently no need to turn out special war qualities of goods such as are pathetically referred to by the correspondent of THE INDIA RUBBER WORLD in another country. At the same time one often hears of goods, especially certain lines of proofings, being accepted by buyers, though they have imperfections which would have caused their rejection in other days. Nowadays, the buyer has often to eat humble pie to get the goods he wants and he cannot afford to be too particular or to stand too much on his dignity.

THE TIRE IMPORT DECISION.

The decision of the government not to stop the import of foreign tires has led to a good deal of feeling in quarters where a ban on the import of American tires had been confidently anticipated. The difficulties in the way of interfering with the American business under certain agreements now in operation between the two countries had not been appreciated, and though the position is accepted philosophically, there is a strong disposition to grumble, and further endeavors, it is understood, will be made by some of those directly interested, to see if the government decision cannot be altered. The latest restrictions regarding the use of petrol for motoring, whereby the pleasure car is to be penalized, will, of course, have an adverse effect upon the tire trade and should automatically lead to a reduction in imports.

WOOLWORTH BUYING ENGLISH RUBBER GOODS.

Some of the smaller rubber works which are not engaged on government work are busy turning out goods which larger firms have no time to attend to. For instance, large orders for rubber sundries have been received from America, which I understand went to Germany in pre-war times. In this connection the name of the large American firm, F. W. Woolworth & Co., is mentioned. This firm, which deals in a large variety of goods sold at low prices, has, I understand, 300 shops in America and possesses a building 50 stories in height.

WILL CONSIDER THE GARMENT WORKERS' STRIKE.

The recent formation of a waterproof section of the India Rubber Manufacturers' Association is interesting and is another instance of the advance in activity of the association since the present chairman, Mr. Goudie, took office. The new section has an important matter in hand in the dispute as to wages in the waterproof garment trade in Lancashire, no settlement having yet been reached.

RAW RUBBER.

The position remains more satisfactory to the manufacturer than the producer, the demand for spot rubber being quiet, showing a tendency to await future developments. At the same time, holders of stocks are in no hurry to sell, believing that the big consumers cannot hold off the market much longer. The expected depletion of British stocks has not come about, mainly on account of the smaller exports to the United States, due to greater difficulties in obtaining export licenses.

THE SYNTHETIC BOGEY.

From authentic accounts to hand, it seems to be a fact that the German shortage of raw rubber for tires has been overcome by the use of synthetic rubber, which has given satisfaction in the war zone. This, though interesting, does not, of course, affect the view generally held that there is extremely little likelihood of synthetic rubber competing with natural rubber in normal times. Nowadays, when certain materials are wanted for war purposes, the price is a very secondary consideration and it is quite probable that at the present price of raw rubber in Germany the synthetic product can compete successfully. Famine prices for certain goods, especially chemicals, are being paid in most of the belligerent countries at the present time and no outcry comes from the sellers thereof, whatever the buyers may have to say on the matter.

NORTH BRITISH RUBBER CO., LIMITED.

The May meeting of the Edinburgh and East of Scotland Section of the Society of Chemical Industry was held in the new laboratory of the North British Rubber Co., Limited, Castle Mills, Professor Walker presiding.

W. A. Williams extended to the society and the visitors a hearty welcome on behalf of the management of the company and expressed the hope that the meeting would be the forerunner of many others in the district and that manufacturers would come forward and show the society what they were doing in scientific and, particularly, chemical work. He apologized for the absence of the company's general manager, Mr. Johnstone, and for the fact that on account of the depletion of the laboratory staff by about 50 per cent through the war, there was not so much to show them as if the times were normal. Professor Walker, in reply, said it was excessively kind of the North British Rubber Co. to let them have this opportunity of seeing its laboratories. It was just at a time like this when the war had made their minds more open than usual that these privileges were most useful and most appreciated. He had always felt from the academical point of view that those who taught in universities had far too little experience in seeing how matters were conducted on a technical and commercial scale, and it was quite certain that if we were to hold our own in the industrial competition which was sure to follow the war, not only with Germany but with other nations, we must more and more have the combination of technical with academic chemistry. The academic chemists must have their minds directed towards the technical openings of the theories and researches which they put before the students and, on the other side, the technical students must be ready to welcome the latest results of research. A paper on the "Raw Material Used by the Rubber Manufacturer" was read by B. D. Porritt and one on "Some Aspects of Synthetic Rubber" by B. D. W. Luff.

EXPORTATION OF TALC PROHIBITED.

The government has added talc to the list of articles the exportation of which is prohibited to all foreign countries in

Europe and on the Mediterranean and Black Seas other than France, Italy, Russia, Spain, and Portugal.

PERSONAL MENTION.

Arthur Mallaby, who, in conjunction with Mr. Bentley, started the Bradford Rubber Co., Shearbridge, Bradford, Yorks, two years ago, reports business as brisk in articles such as rubber tea pot spouts, door stops, gas tubing and molded and cut push-on gas connections.

The Enfield Cable Manufacturing Co., at Brimsdown, Enfield, Middlesex, is now in full swing under the management of Mr. Cowup.

The Birthday Honor list contains the name of Arthur Philip Du Cros, who has been made a baronet. Sir Arthur Du Cros, M. P., for Hastings, is the managing director of the Dunlop Rubber Co. Besides holding a post at the Ministry of Munitions, he has taken an active part in the provision of motor ambulances for the war.

Another name on the list is F. W. Whitby-Thomson, who has received a knighthood. He is connected with the English Card-clothing Manufacturers' Association.

Dr. W. A. Caspari, Ph.D., has received the degree of Doctor of Science from the Victoria University, Manchester.

In case any confusion should arise, I may mention that the Premier Waterproof & Rubber Co., of Bromley street, Manchester, is quite distinct from the Premier Rubber Works, of Bent street, Chatham, Manchester. This works is owned by W. S. Rothbald & Co., patentees and manufacturers of india rubber and vulcanite surgical appliances.

The waterproofing works of both Ferguson, Shiers & Co., Limited, and A. O. Ferguson & Co., near Manchester, have had outbreaks of fire, but without seriously interfering with the businesses.

The will of the late J. E. Baxter was proved for £10,379 and that of the late W. M. Henderson for £27,257.

OTHER BRITISH NOTES.

A TIMELY AND INGENIOUS ADVERTISEMENT.

A clever advertisement, especially timely, was that of the Republic Rubber Co., Limited, London, which appeared in the "Observer" and "Sunday Times," the day when the daylight saving bill went into effect. It read: "As clear as DAY-LIGHT is the SAVING you effect by fitting Republic Tires." A clock face was shown, as here reproduced, and subheads in the advertisement read:



"On the one hand you have service,"
"On the other hand you have durability." These, of course, have direct connection with the illustration of the clock, which is a splendid example of connective advertising, that everyone is striving to attain.

The idea and its working out was by Ernest A. Gleich, managing director of the London "Republic" organization, who believes in striking while the iron is hot, especially in getting out novel automobile advertising.

LETTERS OF THANKS TO THE RUBBER GROWERS' ASSOCIATION.

Our friends of the Rubber Growers' Association, London, have been kind enough to forward us a copy of a circular which Secretary Frank G. Smith recently sent to the members, calling attention to the great value of the 4,500 pairs of rubber boots, donated by them, to the men in the trenches. A perusal of this circular gives an idea of the appreciation of the wearers; containing, as it does, extracts from a score of letters chosen from the many received from officers and men of the various units of

the British army in the fighting lines, telling how the men have been made comfortable and saved from cold and pneumonia, and possible death, by these boots, so generously donated. This circular, which is sent only to the members of the Rubber Growers' Association, states that if the war should extend through another winter, there is no doubt that further supplies, in greater number, will be despatched.

TYPKE & KING'S NEW ADDRESS.

Typke & King, Limited, chemical manufacturers, London, England, with a view of centralizing their business, have removed their offices to their manufacturing plant, and their address is now "Crown Chemical Works, Mitcham Common, Surrey, England." Thus all their business is consolidated, though they still retain a buying office at the old 16 Mincing Lane address. It is their desire that all communications shall be directed to Mitcham. Their cable address is now "Valerianic, Mitcham."

THE GOODRICH COMPANY'S LONDON TIRE DEPOT.

The B. F. Goodrich Co., Limited, London, England, is now maintaining a tire-fitting depot, furnished with a thorough equipment for dealing efficiently with all kinds of truck tire repairs and renewals. It is stated that nearly 14,000 tires are carried in



stock, in both millimeter and inch sizes. The latter are of increasing importance in view of their general use on American chassis. A corner of the new tire depot shown in the illustration gives a good idea of its spaciousness, and of the abundance of stock carried.

THE SITUATION IN FRANCE.

By Our Regular Correspondent.

IT occurs to me that your American readers would be interested in a few details regarding general industrial conditions here in France today, and the conditions that are likely to prevail after the conclusion of hostilities. Much speculation on this subject has been evidenced in foreign newspapers, and I have noted that the real situation is not well understood by American writers.

VALUE OF THE FRANC IN FRANCE.

The value of a franc in France is the same as it always was. Its exchange value is much less, due to the fact that the balance of trade is against France. As a consequence of this, the purchasing value has fallen. In France a franc purchases less now than in normal times because everything is more costly. It is not the franc that has changed in value, but it is the things that one purchases in France that have become dearer because of lesser supply or greater demand.

PRODUCTION COST OF RUBBER GOODS.

As a consequence of prevailing conditions here, the rubber industry is burdened with additional costs that can be classed as follows:

First; costs affecting the raw material, caused by higher rates of exchange in the Far East and other regions producing crude rubber; increased ocean freight charges, in many instances as much as 250 per cent; increased cost of marine insurance, in some cases amounting to 1,425 per cent and small increases in the costs of transporting merchandise, stevedoring, etc., due to labor shortage.

A second cause for high costs is the increase in maintenance expenses, that is to say, the upkeep of machinery, appliances and equipment, due to higher cost of such materials as iron, steel, copper, wood, leather, etc.,—in general, all factory supplies. This increase amounts on an average to 100 per cent.

Third, general overhead expenses are extremely high; coal, mineral oils, greases, chemical products, cardboard, paper, stationery, etc., have all advanced 100 per cent.

GENERAL EFFECT ON MANUFACTURING INDUSTRIES.

Taking into account the universal military service throughout France, it can easily be understood that the effect of the war upon manufacturing industries has been very pronounced. The help is taken away, no one is left behind to do the work except those physically unable to serve in the army. Raw material is hard to obtain, and it is costly. Coal is three times as high as in normal times. To all of this is to be added the difficulty of running a plant under such a disorganized condition of affairs as necessarily prevails. Few plants can reach normal efficiency.

Industries dependent upon enemy countries for certain articles such as dyestuffs, or which are dependent upon such countries for the sale of their products, are naturally great sufferers.

Industries are going ahead, but in a much crippled manner. Business is good. The only difficulty is to fill orders.

CONDITIONS AFTER THE WAR.

After-war conditions are being freely discussed throughout France, and there will be no lack of initiative in going ahead as soon as peace is reestablished. The great industries of the invaded territories will be rapidly reconstructed and reorganized. In those districts machinery has suffered as much as buildings. The latter can be easily and rapidly reconstructed, but the machinery problem will present greater difficulties. The market which war-stricken districts will offer is enormous. Everything there appears to have been either stolen or destroyed. When the men come back from the trenches, they too will have to pass through a period of reconstruction, as they have been away so long from civilian life.

Wages after the war will be higher than they were previous to the great struggle, so will raw materials, and, consequently, the cost of production will be greater than before the war. Freights also will be on a high level.

TREATIES.

The allied nations will arrange treaties and tariffs to favor themselves and their colonies. Increased and discriminating export duties will be placed on colonial products and arranged so as to favor the Allies. In this respect the Central Powers are sure to be placed at a great disadvantage for the supplies of such colonial products as rubber. The great demand for labor, if nothing else, is sure to make labor high, and it is certainly easier to increase wages than it is to reduce them.

DUMPING.

I understand that in America, you fear the dumping of stocks of merchandise accumulated in Europe during the war. I do not believe this fear well-founded. The Central Powers have acquired much material as a result of conquest, but with the prolongation of the war and the Allies' blockade, these powers will have been obliged to use up much of their spoils. This opinion is supported by the following instance: The invaders took enormous quantities of cloths and fabrics from the Lille-

Tourcoing-Roubaix district, but they are obliged to use these goods; we have captured prisoners wearing uniforms made of Roubaix cloths, and have brought down aeroplanes, in the make-up of which we found much Lille-made linen. Of course, these are but instances, but they indicate conditions and speak louder than words.

No doubt there will be some dumping in certain lines of merchandise, but I believe little is to be feared on this score. It will be found that the Central Powers, like France and her Allies, will have been more engaged in making shells and other war munitions than in making great stores of manufactured goods.

RECAPITULATION.

After peace is reestablished, and after the period necessary for reorganization and the return to normal conditions, the cost of manufacturing in France will approach the same level as before the war, but will be rather above than below ante-bellum levels.

Raw materials will continue at high prices for a year or so, due to the exhaustion of supplies throughout Europe.

TIRES FOR MILITARY PURPOSES.

The situation here is practically the same as it was when I mailed my last letter. The Verdun struggle is still on, and, besides men and ammunition of all kinds, it continues to consume enormous quantities of rubber tires, both solid and pneumatic. However, there is no more shortage of



AN ARMY TIRE DEPOT IN PARIS.

tires here than there is a shortage of other elements of modern warfare. Worn tires are readily replaced by new ones and the constant travel of rubber-tired vehicles, to and from the front, continues without interruption. To fill the demand has been a heavy task, but we were ready for all emergencies and everything has been moving like clockwork in the industries as well as in the army.

IMPORTS PROHIBITED.

Recent presidential decrees prohibit the importation into France and Algeria of various articles, among which are automobiles, automobile rims, bicycles and parts thereof.

OBITUARY.

It is my sad duty to inform you of the death of Lieutenant C. L. Gatin, one of our leading tropical agricultural scientists, who was a representative of France at the last (1914) Rubber Exhibition in London and a member of the expert staff of our leading tropical agricultural paper, the "Journal d'Agriculture Tropicale." Lieutenant Gatin was killed while leading his company of Zouaves in the defense of Verdun. His premature death is mourned by his wife, his mother and hosts of admiring friends.

PERSONAL.

Lieutenant Alcan, of the firm of Alcan & Cie, successors to Hecht Frères, Paris, dealers in rubber goods, has been made Knight of the Legion of Honor, a deserved recognition of his special valor in the present war.

Rubber Planting Notes.

COSTS OF PRODUCTION OF PLANTATION RUBBER.

THE advisability of publishing or not publishing costs of production of plantation rubber is a subject that is troubling the minds of the directors of Far Eastern rubber plantation companies.

With the constant growth of the consumption and the increase in production of plantation rubber, the cost of production has been decreasing. Each year the cost is lower than the preceding, a tendency that is in evidence in the following table, compiled from figures disclosed in company reports recently published. This shows the production cost per pound of dry crude rubber for the past three years.

Cost per Pound in U. S. Currency.

	1913.	1914.	1915.
Banteng (Selangor)	48.74	33.33	28.33
Bekoh	44.00	38.33	29.00
Batak Rabit	32.50	32.33	29.00
Broome (Selangor)	56.00	37.33	31.00
Bukit Lintang	39.33	30.33	24.60
Inch Kenneth	39.40	31.33	29.00
Kamuning	44.33	29.33	28.00
Seaport	46.33	34.33	28.33
Selangor	50.66	38.33	26.00
Sangkai Chumor	43.33	32.00	26.00
Tanjong Malin	53.66	41.00	31.00
Average cost	45.30	34.36	28.20

TAPPING SYSTEMS.

In his annual report on agriculture for 1915, in North Borneo, E. Bateson, director of agriculture, made some remarks on tapping systems. He wrote:

It will probably be some years before the relative merits of the different systems are definitely established to the satisfaction of everyone; in the meantime it is desirable to adopt the system which has the balance of experimental evidence in its favor. The system which appears likely to become most general in North Borneo is that of placing two cuts one above the other on a single quarter of the tree. On anatomical and physiological grounds, however, there is good reason for believing that it is better to place the two cuts on adjacent quarters. This has been confirmed by tapping experiments in the Federated Malay States, which, so far as they have gone, all indicate the superiority of the adjacent-quarters system in point of yield. A further advantage of this system is that it favors the nourishment of the renewing bark, and gives quicker renewal than the single-quarter system. When trees are tapped on adjacent quarters the cuts are commonly made in the form of a V, but it has been proved that a tapping cut sloping up to the left yields about 14 per cent more rubber than a cut of the same length sloping up to the right. A left-handed half-spiral, therefore, will yield about 7 per cent more than the basal V.

EXPORT DUTIES ON CAMEROONS CRUDE RUBBER.

The British Board of Trade announces that the German imports and exports tariff remains in operation in the Cameroons, which is now under British military occupation.

The export duty on rubber, except plantation rubber, which is exempt from duty under special provisions, amounts to four cents per pound in United States currency.

RUBBER PROSPERITY OF THE FEDERATED MALAY STATES.

E. Burnside, Commissioner of Trade and Customs, Federated Malay States, in a speech at the general meeting of the Selangor Chamber of Commerce, reviewing the prosperity of the Federated Malay States in the last 25 years, said that in 1890 the total value of the trade of the four States amounted to only \$5,714,187 [\$27,808,091], whereas in 1915 it was valued at £26,106,773 [\$127,048,611]. The total exports of plantation rubber in 1915 amounted to 44,523 tons, with a value for revenue purposes of £10,897,365 [\$53,032,047], more than 40 per cent of the total value of exports.

RUBBER IN NYASALAND.

The British Colonial Report on Nyasaland for the fiscal year 1914-1915, recently published, would lead to the belief that rubber cultivation is not a success in the Protectorate. With the low prices prevailing during the year covered by the report, little interest centered in rubber, and most of the estates in the Nyasaland Shire Highlands have ceased tapping or abandoned cultivation.

The harvesting of wild rubber has practically ceased, and at the prevailing prices there is little likelihood of any quantity of Ceara and wild rubber being exported. The *Hevea* rubber planted in the West Nyasa district is giving indications of satisfactory development. The value of the exported crop amounted to only \$3,423 [\$16,658], as compared with £9,598 [\$46,709], showing a decrease of £6,175 [\$30,050]. The area under cultivation dropped from 10,562 acres to 5,936.

RUBBER FROM GERMAN WEEDS.

MENTION has been made of the efforts of German scientists to obtain rubber from plants indigenous to Central Europe. The following letter, from a chemist in Leipzig, who has been drafted into government work, will be read with interest.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

In your excellent journal, dated May 1, 1916, your German correspondent speaks somewhat sceptically of the value of some plants as a source of caoutchouc. I write to inform you that German scientists have apparently found a really valuable plant for this purpose in *Lactuca Viminalis* (in German called *Rutenlatich*). Exhaustive tests have shown that the milk exuding from cuts in stem and root of this plant, after the latter has reached the age of 18 months, consists of a dark yellow liquid which on exposure to the air turns brown and becomes exceedingly tough and sticky. As the plant reaches a height of six feet, and the milk is fairly abundant, the yield of a field of *Rutenlatich* in this "rubber substitute" is not by any means to be despised.

According to the announcement of government chemists who have made the tests, the milk contains about .49 of caoutchouc, representing a very high percentage, as there are only a few rubber plants which exceed it (*Hevea Brasiliensis*—only .30; other *Hevea* species even less!).* Plans are said to be under way now to cultivate this *Lactuca* species throughout Germany, it being found wild only in the southeastern sections, south of the Warthe and east of the Elbe rivers, as well as in Austria-Hungary.

In the course of the investigations covering the various types of "rubber weeds" it was found that the *Günsedistel* (goose thistle) yields a fair quality of caoutchouc to the extent of .16; *Wolfsmilch* (wolf's milk) contains .27 of caoutchouc, and many other plants of these families yield caoutchouc in quantities ranging from .12 to .25 per cent.

**Hevea Brasiliensis* latex yields from .30 to .45 of caoutchouc.

NEW JAPANESE RUBBER COMPANY.

The American Consul-General, Yokohama, Japan, reports that several business men in Tokyo and Osaka, Japan, are planning to promote a rubber company, with a capital of 2,000,000 yen [\$997,000], in the Federated Malay States.

Constantinople, in normal times, annually exports waste rubber to the amount of 900,000 pounds valued at about \$50,000. Rubber shoes are imported to the value of approximately \$400,000, and the extent to which the United States participates in this trade is shown by the figures for 1913 and 1914. In the former year we sent to Constantinople 121,988 pairs, valued at \$59,155. In 1914 the figures were 64,278 pairs, valued at \$33,097.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED MAY 16, 1916.

- N**O. 1,182,925. Detachable rim for vehicle wheels. G. H. S. Moyes, Pittsburgh, Pa.
 1,183,032. Elastic tire block for vehicle wheels. H. Raflovich, New York City.
 1,182,033. Wheel rim and tire construction. H. Raflovich, New York City.
 1,183,036. Artificial foot having a rubber heel. J. F. Rowley, Chicago, Ill.
 1,183,037. Elastic leather, composed of elastic webbing and impregnated leather. M. Scheuer, assignor to American Belt Corporation—both of New York City.
 1,183,060. Garment supporter comprising adjustable elastic strips. M. D. Brown, Baltimore, Md.
 1,183,108. Hair clasp comprising an elastic band. E. Noyes, West Kensington, London, England.
 1,183,180. Rim comprising an automatic tire remover. J. G. Faria, Wilfords, Calif.
 1,183,212. Suction cup bracket support. W. Lenzikow and D. Bühler, New York City.
 1,183,365. Safety tread. J. O. Fowler, New York City.
 1,183,440. Pneumatic tire. B. W. Davis, Chicago, Ill.
 1,183,481. Self filling fountain pen. O. A. Morrow, Pittsburgh, Pa.
 1,183,518. Demountable rim construction. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.
 1,183,533. Demountable rug. E. P. Calvin, Sardinia, Ohio, assignor of one-tenth to W. W. Masters, Indianapolis, Ind.
 1,183,545. Interchangeable rubber heel for shoes. T. Doody, Duluth, Minn.
 1,183,595. Cushion tire. S. A. Rouse, Chicago, Ill.
 1,183,727. Pneumatic wheel. J. Greppi and A. Romanach, Buenos Aires, Argentina.
 1,183,728. Rubber nursing nipple. R. Griffith, assignor to The Miller Rubber Co.—both of Akron, Ohio.
 1,183,796. Parachuting attachment for balloons. G. L. Bumhaugh, assignor of one-half to A. L. Waters—both of Indianapolis, Ind.
 1,183,874. Dress shield stiffener. H. D. Hardeste, Atlantic City, N. J.
 1,183,914. Armored diving device. H. E. Senger, assignor to the firm of Neufeldt & Kuhke both of Kiel, Germany.
 1,183,965. Tire. G. F. Fisher, Hainfield, N. J., assignor to Morgan & Co., Detroit, Mich.
 1,184,032. Bathing cap. O. Schron, Milwaukee, Wis., assignor to M. Neumann, Berlin, Germany.
 1,184,118. Hoof pad. F. W. Oman, Spokane, Wash.
 1,184,136. Tire plug embodying an elastic cushion. R. W. Sampson, Westmont, Quebec, Canada, assignor of one-half to L. Schwab, East Orange, N. J.
 1,184,175. Non-skid tire protector. A. Goodall, Portland, Ore.
 1,184,200. Tire alarm. C. V. Amburge, Tacoma, Wash.
 1,184,225. Resilient shoe heel. J. H. Brown, Marseilles, Ill., assignor of one-half to J. H. Brown, Cleveland, Ohio.
 1,184,229. Resilient wheel. D. L. Crosbie, Sacramento, Calif.
 1,184,257. Construction of the covers of pneumatic tires. W. E. Muniz, London, England.
 1,184,258. Tire shoe for vehicle wheels. C. F. Nickerson, Reading, Mass.
 1,184,317. Water-excluding device for bathing caps. E. S. Bullard, Wheeling, W. Va.
 1,184,325. Inflatable rescue float. J. S. Coxley, Massillon, Ohio.
 1,184,371. Compression bulb. H. A. Myers, assignor of one-half to A. S. Hickok both of Toledo, Ohio.
 1,184,469. Method of making rubber and fabric piston rod packings. C. I. E. Maston, Midland Park, N. J.
 1,184,484. Hose coupling. F. N. Muller, assignor to Republic Hose Coupler Corporation—both of Buffalo, N. Y.
 1,184,632. Test cup for milking machines. C. de Leon, Dayton, Ohio, assignor to N. D. Rutherford.
 1,184,691. Bead for pneumatic tires. H. K. Raymond, assignor to The B. F. Goodrich Co.—both of Akron, Ohio.
 1,184,717. Antiskid device. V. L. Bowman, Alameda, Calif.
 1,184,820. Tire stem cover. R. A. Campbell, Minneapolis, Minn.
 1,184,838. Implement for washing clothes. A. Edwards, New York City.
 1,184,970. Syringe. W. W. Larsen, San Francisco, Calif.
 1,185,044. Wheel rim. G. B. Austin, Junco, Nev.
 1,185,082. Rubber tire. A. G. Fitz Gerald, Boston, Mass., assignor to Reliance A. C. Co., Inc., New York City.
 1,185,084. Tire protector. W. H. Gahan, Victoria, British Columbia, Canada.
 1,185,119. Lineman's rubber shoe. H. E. Marshall, Highland Park, Mich.
 1,185,215. Hose coupling. J. Lezzeni, Fairfax, Calif.
 1,185,241. Resilient tire for vehicles. J. Beynon, Youngstown, Ohio.
 1,185,365. Tire with tubular sections and lining of wool waste. F. D.

- Brown and Rose Seals Brown, Josephine County, near Grants Pass, Ore.
 1,185,386. Life-saving apparatus. J. L. Edlund, Claresholm, Alberta, Canada.
 1,185,388. Extension fountain pen. H. P. Fairchild, assignor to F. G. Fairchild—both of New York City.
 1,185,403. Vehicle wheel tire. F. A. Howarth, Philadelphia, Pa.
 1,185,411. Rubber swimming glove. C. D. B. Kennard, Winnipeg, Manitoba, Canada.
 1,185,432. Golf ball made from overwound strips of rubber and balata. L. T. Petersen, Youngstown, Ohio.
 1,185,444. Non-slipping tread. F. H. Stanwood, Arlington, Mass., assignor to Stanwood Equipment Co., Maine.
 1,185,445. Non-slipping tread. F. H. Stanwood, Arlington, Mass., assignor to Stanwood Equipment Co., Maine.
 1,185,451. Rubber tire. J. Thomson and E. L. Pratt, Syracuse, Nebr.
 1,185,583. Suction cup massage instrument. J. W. Bond, Providence, R. I.
 1,185,606. Rubber heel. S. D. Smith, East Dedham, assignor of one-half to J. C. Kennedy, Boston—both in Massachusetts.

ISSUED JUNE 6, 1916.

- 1,185,660. Pneumatic tire and inflation means therefor. R. Harris and N. Harris, Newark, N. J.
 1,185,684. Valve for pneumatic pillows and other articles. H. P. Kraft, New York City, and M. C. Schweinert, West Hoboken, N. J., assignors to A. Schrader's Son, Inc., New York City.
 1,185,714. Non-skid vehicle tire. A. Rich, Stamford, Conn.
 1,185,769. Emergency rim and tire. R. E. Cloud and F. C. Taylor, Ensley, Ala.
 1,185,986. Pneumatic tire. P. J. Collins, New York City.
 1,186,029. Demountable rim. P. Overman, assignor of one-half to H. V. Turner both of San Francisco, Calif.
 1,186,153. Vehicle tire holer comprising a rubber-covered felt core. R. S. Wicks, Mount Vernon, Wash.
 1,186,160. Inner casing for automobile tires. C. L. Archer, Council Bluffs, Iowa.
 1,186,225. Nipple. L. R. Neiswender, Phoenixville, Pa.
 1,186,311. Tire for motor vehicles. I. H. Hamlin and J. C. Burford, Winston-Salem, N. C.
 1,186,316. Rubber friction elements for hat bands. R. H. Holmes, Woodmere, N. Y.
 1,186,427. Pneumatic tire. D. C. Roberts, Trenton, N. J.
 1,186,453. Resilient non-collapsible tire. D. E. Tillman, Selma, Ala.
 1,186,460. Automobile tire. F. D. Wassell, Wilkesboro, assignor of six-tenths to H. B. Wassell, Pittsburgh—both in Pennsylvania.
 1,186,467. Flexible metallic protector for rubber tires. F. H. Brueggemann, Norwood, assignor of one-fourth to J. W. Heintzman, Cincinnati, and one-fourth to H. F. Rohmann, Norwood—all in Ohio.
 1,186,472. Rubber tire. W. B. Estes, assignor of one-half to M. F. Amone, N. E. Amone, and J. M. Amone—all of West Orange, N. J.
 1,186,492. Noise reducing platen for typewriters. W. R. Mulock, Winnipeg, Manitoba, Canada.

ISSUED JUNE 13, 1916.

- 1,186,550. Hand rail for escalators comprising a channeled member of rubber. H. Z. Cobb, Winchester, Mass., assignor to Revere Rubber Co., Providence, R. I.
 1,186,551. Flexible hand rail for escalators comprising a circular rubber impregnated braided strip. H. Z. Cobb, Winchester, Mass., assignor to Revere Rubber Co., Providence, R. I.
 1,186,613. Stretchable leather belting which comprises a sheet of elastic. M. Scheuer, assignor to American Belt Corporation—both of New York City.
 1,186,722. Hose coupling. G. E. Young, Waterbury, Conn.
 1,187,006. Packing. N. B. Miller, Haddon Heights, N. J.
 1,187,029. Basket ball and similar playing ball. J. L. Beebout, Canton, Ohio.
 1,187,065. Toy water pistol having a rubber bulb. C. W. Kallenbaugh, Duquesne, Pa.
 1,187,106. Automobile wheel rim. W. B. Schaeffer, Portland, Ore.
 1,187,131. Test cup. L. Bull, Libertyville, Ill.
 1,187,132. Hose supporter. M. C. Calkins, Brooklyn, N. Y.
 1,187,149. Method of repairing ruptured pneumatic tubes. J. C. Irvin, Jersey Shore, Pa.
 1,187,150. Alarm for pneumatic tires. C. E. Johnson, Grand Rapids, Mich.
 1,187,154. One-way valve. H. P. Kraft, New York City, and M. C. Schweinert, West Hoboken, N. J., assignors to A. Schrader's Son, Inc., New York City.
 1,187,173. Tire chain and armor. W. J. Putnam, Deposit, N. Y.
 1,187,260. Shock absorber for firearms. R. S. Cross, Westport, N. Y.
 1,187,330. Device for locking electric lamp bulbs in receptacles having an elastic washer. F. Jordan, San Francisco, Calif.
 1,187,386. Cable insulation stripper. A. A. Fehson, New York City.
 1,187,418. Blow out patch for pneumatic tires. J. N. Davis, Denver, Colo.
 1,187,430. Hose clamp. W. F. Kenly, assignor of one-half to L. C. Grove—both of York, Pa.

THE DOMINION OF CANADA.

ISSUED MARCH 31, 1916.

- *167,989. Cover for a sink drain. D. J. Connell, Butte, Mont.
 *168,002. Infant's grooved feeding bottle with a rubber ring in each groove. O. H. Shultz and E. Benson, assignee of a half interest—both of Edmonton, Alberta, Canada.
 *168,018. Teat cup for milking machines. C. O. Anderson, Lancaster, Pa.
 *168,031. Valve for tires. R. S. Burn, Hull, York, England.
 *168,055. Typewriter platen having an inner layer of elastic. W. R. Mulock, Winnipeg, Manitoba, Canada.
 *168,088. Fountain pen. R. L. Warnock, Warnock, Ohio.
 *168,099. Rubber eraser for fountain pens. F. C. Graham, Aylmer, Quebec, Canada.
 *168,097. Pneumatic tire for vehicles. C. F. A. Gray, Montreal, Quebec, Canada.
 *168,133. Fountain pen mechanism. The L. E. Waterman Co., Limited, St. Lambert, Quebec, Canada, assignee of E. F. Britten, Jr., Jersey City, N. J.
 *168,144. Spring tire. T. Comeau and A. E. Ouellet, assignee of a half interest—both of Lawrence, Mass.
 *168,181. Non-skid attachment for tires. J. L. Duff, Cambridge, Ohio.
 *168,213. Life preserver. J. E. Lomas, Smuggler, Colo.
 *168,225. Tire anchor. M. J. O'Connor, Sarnia, Ontario, Canada.
 *168,237. Tire cushion. J. E. Parrish, Richmond, Va.
 *168,263. Life-saving device. B. Zopf, Santa Rosa, Calif.
 *168,273. Hose coupling. The Universal Coupler Co., Philadelphia, Pa.
 *168,381. Life preserver. O. A. Youngren, Sheridan, Wyo.
 *168,420. Fountain pen. The L. E. Waterman Co., Limited, Montreal, Quebec, Canada, assignee of W. I. Ferris, Westfield, and E. F. Britten, Jr., Jersey City—both in New Jersey.
 *168,465. Fastener for overshoes. R. P. Dobson, Ravenna, Ontario, Canada.
 *168,479. Pneumatic tire tube. R. I. Henderson, Toronto, Ontario, Canada.
 *168,523. Tire tool. M. H. Stewart, Detroit, Mich.

THE UNITED KINGDOM.

SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent upon the filing of the application.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MAY 17, 1916.]

- 1,057 (1915). Tire for vehicle and like saddles made of canvas and rubber fabric. J. Jolly, 41 Spon street, Coventry.
 1,128 (1915). Confectionery molds of rubber. R. C. Burger, 92 Yonge street, Toronto, Canada.
 1,175 (1915). Carpet comprising strips of elastic webbing. D. Kops, 525 West End avenue, Manhattan, N. Y.
 *1,176 (1915). Carpet comprising strips of elastic webbing. D. Kops, 525 West End avenue, Manhattan, N. Y.
 1,194 (1915). Method of inserting studs in tire treads. F. E. Blaisdell, 63 St. James' street, London.
 1,236 (1915). Rubber pads for the bottoms of ladders. W. Thomson, 774 St. Helen's Road, London, Lancashire.
 1,296 (1915). Solid or cushion tire. A. H. Greenfield, 92 Earl's Court Road, London.
 1,447 (1915). Inflatable life saving garment. C. E. Hartley, 61 West Dock avenue, Kingston-upon-Hull.
 *100,183 (1916). Safety valve for tires. S. Kahn, 83 Court street, Newark, N. J.
 100,186 (1916). Double chambered teat cups for milking machines. O. V. E. Gösling, 4 Fridhemsgratan, Stockholm.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MAY 24, 1916.]

 1,500 (1915). Electric lamp provided with a rubber washer. B. J. Grigsby, 14 Rosebery avenue, London.
 *1,576 (1915). Life-saving suit having an air bag with inflating tube. O. A. Youngren and R. H. Stump, Sheridan, Wyo.
 *1,591 (1915). Toy ship and torpedo propelled by elastic cord. W. H. Huth, 6136 Sheridan Road, Chicago, Ill.
 *1,595 (1915). Tire valves. M. C. Schweinert, 226 Palisade avenue, West Hoboken, and H. P. Kraft, 219 Godwin avenue, Ridge-wood—both in New Jersey.
 1,631 (1915). Means for securing rubber heels to shoes. P. Lace, 19 Parkfield Drive, Liscard, Cheshire.
 1,651 (1915). Doors for storage chambers and safes made air tight by the use of rubber sheets. A. J. Roach-Cuming, 68 Cowcross street, London.
 1,715 (1915). Lamp reflector and globe carrier, comprising a rubber washer. W. Sanders & Co., and W. Sanders, 7 Oxford street, Birmingham.
 *1,767 (1915). Electrically actuated diving chamber with air hose attached. W. D. Sisson and J. L. Buchanan, 543 Title Insurance Building, Los Angeles, Calif.
 1,817 (1915). Air tube for wheel tires. M. S. Stevenson, 41 Cheapside, London.
 1,889 (1915). Military overboot having a legging continuation and a hard rubber insole. Soc. Anon. Etablissements Hutchinson, 60 Rue St. Lazare, Paris.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MAY 31, 1916.]

- 2,019 (1915). Machine and machine packing. G. W. Beldam, Briston Lodge, Ealing, London.
 2,021 (1915). Elastic reinforced shoe lining. V. L. Grosjean, 10 Rue de Paris, Compiegne, Oise, France.

*Denotes Patents for American Inventions.

- 2,041 (1915). Inflatable life preservers and chest and lung protectors. J. A. L. Nixon, 33 Overgate, Dundee.
 2,100 (1915). Rubber cap for the mouthpiece of a pipe or holder. H. P. Simpson, 39 Victoria street, Westminster.
 2,104 (1915). Inflatable life belt. T. D. MacFarlane, 515 Metropolitan Building, Vancouver, B. C.
 2,133 (1915). Sponge rubber pad in machine for labeling bottles, packages, etc. P. J. Purdy, 10 Euston Buildings, George street, London.
 2,156 (1915). Sponge rubber pad in machine for labeling bottles, packages, etc. P. J. Purdy, 10 Euston Buildings, George street, London.
 *2,166 (1915). Rubber tires. W. H. Dane and C. de Lukasevics, 26 Oak Crest Place, West Nutley, N. J.
 2,235 (1915). Golf ball. W. Taylor, Southlase, Elms Road, Knighton, Leicestershire.
 2,256 (1915). Rubber overshoes for use on bowling greens, etc. C. Woollett, 11a Oxtown Road, Poulton, Seacombe, Cheshire.
 100,212 (1916). Printing blankets. H. Hartmann, Globus, Gummi und Asbestwerke Ges., Ahrensbock, Germany.

NEW ZEALAND.

ISSUED APRIL 13, 1916.

- 36,368. Rubber sound-absorbing tape for milking machines. The Kidd Milking Machine Co., Limited, Queen street, New Plymouth, N. Z.
 36,891. Teat cup for milking machine. H. W. Bartram, 586-588 Bourke street, Melbourne, and A. Gillies, "Glencairn," Templestowe Road, Heidelberg—both in Victoria.
 37,195. Milking machine teat cup. R. N. Pilkington, Hamilton, N. Z.

ISSUED APRIL 27, 1916.

 37,278. Teat cup. G. E. Walker, Hamilton, N. Z.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

- 479,587 (June 10, 1915). Elastic wheel. Hablé Technical Tyre Co., Limited.
 479,593 (June 11). Elastic wheel. E. F. Cahin.
 479,623 (June 14). Improvements in elastic tires for motor vehicles. R. J. Wickham.
 479,045 (June 16). Protector and anti-skid device for pneumatic tires. A. E. Hughes.
 479,047 (June 23). Pneumatic wheel. F. Personé.
 479,117 (June 26). Improvements in lateral mud-guards and splash-guards for automobile wheels and the wheels of other vehicles. H. V. N. Gravelle.
 479,157 (November 28, 1914). Improvements in pneumatic tires. The Helix Tube Co.
 479,198 (July 6, 1915). Automobile tire. E. J. Mitchell.
 479,219 (July 13). Elastic tire. J. B. Bernard.
 479,223 (July 7). Elastic wheel for vehicles. C. Multhmann.
 479,227 (July 6). Improvements in insulated cables for the transmission of high-tension electric currents. Beaver and Claremont.
 479,256 (July 10). Device for protecting pneumatic tires, cycles and similar vehicles. J. C. Jørgensen.
 479,259 (July 12). Improvements in pneumatic tires. James & Milford.

TRADE-MARKS.

THE UNITED STATES.

- 83,249. The B. F. Goodrich Co., New York City. Two red diamond-shaped figures located end to end circumferentially of a tire on the side of the latter. For pneumatic tires.
 89,097. Gumbo Co., Asheville, N. C. Words Gum-Bo-Chew. For chewing gum.
 92,332. The Goodyear Tire & Rubber Co., Akron, Ohio. The word Elm. For rubber hose.
 92,333. The Goodyear Tire & Rubber Co., Akron, Ohio. The word Elect. For rubber hose.
 92,334. The Goodyear Tire & Rubber Co., Akron, Ohio. The word Ex-terminator. For rubber hose.
 92,335. The Goodyear Tire & Rubber Co., Akron, Ohio. The word Glide. For rubber hose.
 92,336. The Goodyear Tire & Rubber Co., Akron, Ohio. The word Ash. For rubber hose.
 92,337. The Goodyear Tire & Rubber Co., Akron, Ohio. The word Drill-well. For rubber surfaced fabric belting.
 93,315. A. & A. Rubber Co., Framingham, Mass. A combination of A & A, R. Co. and Dunlop within a circle. For heels, etc., made of rubber and fiber.
 93,604. Lund-Mauldin Co., St. Louis, Mo. The word Lundin. For rubber boots, etc.
 94,215. The Vanola Co., Winston-Salem, N. C. The word Vanola. For chewing gum.
 94,299. H. C. Wilson, Los Angeles, Calif. The word Reo. For ball chewing gum.
 93,217. United States Rubber Co., New Brunswick, N. J. A white bar between two blue bars of equal width. For overshoes of rubber and tennis shoes of rubber and fabric.
 93,717. The Miller Rubber Co., Akron, Ohio. The words "Confectioners' Special." For toy balloons.
 94,057. Asley Rubber Co., Hudson, Mass. The word Rock-Hill. For rubber boots, overshoes, shoes and rubbers.
 94,778. Snes de Jose Martinez S. en C., San Juan, Porto Rico. The words Our Regard. For rubber shoes, etc.

- 91,022. The Scholl Manufacturing Co., Chicago, Ill. A heavy line ellipse broken away at one portion. For dental, medical and surgical appliances.
- 92,749. The Goodyear Tire & Rubber Co., Akron, Ohio. A blue streak is displayed upon the outer face of the hose and extending longitudinally thereof, and the words *Blue Streak* printed in block letters on the outer face of the hose. For rubber hose.
- 93,396. Panama Rubber & Equipment Co., St. Louis, Mo. The word *Farco*. For automobile tires.
- 94,294. S. A. & H. Myers, Boston, Mass. The S. A. & H. M. Rain Check illustrated within a square. For raincoats.
- 94,300. Wright & Ditson, Jersey City, N. J., and Boston, Mass. The word *Birdie*. For golf balls.
- 94,301. Wright & Ditson, Jersey City, N. J., and Boston, Mass. The word *Bisk*. For golf balls.
- 94,344. John Wanamaker, New York City. The words *Blue Flash*. For golf balls.
- 94,516. Schmelzer Arms Co., Kansas City, Mo. The word *Kilty*. For golf balls.
- 86,499. George Benton Wood, Duluth, Minn. The representation of a pneumatic tire with the word *Woods* illustrated on one half of center and the words *Locktite* and *Patch* on tire. For inner tube and casing patches for vehicle tires.
- 90,126. The Miller Rubber Co., Akron, Ohio. The word *C-Kure-Nek*. For hot water bottles, etc.
- 90,942. Seneca C. Lewis, Greensburg, Pa. The words *Lewis* and *No Jar*. For rubber supports for timepieces.
- 93,467. New Jersey Car Spring & Rubber Co., Jersey City, N. J. The word *Carspring*. For rubber hose, packing and tires.
- 93,875. Michigan Waterproofing Co., Grand Rapids, Mich. The word *Isihure*. For rubber dressing and preservative, etc.
- 94,175. Reid Bros., Seattle, Wash., and San Francisco, Calif. An illustration of a walrus head and the words *Walrus Sheeting* within a circle. For waterproof hospital sheeting.
- 90,911. The Standard Tire & Rubber Manufacturing Co., Cleveland, Ohio. A design of a wreath with an eagle standing on top of the letter S in the center. For rubber and fabric tires and tubes.
- 92,291. Geo. E. Keith Stores Co., Brockton, Mass. The word *Gekco*. For boots and shoes of rubber and other fabric construction.
- 94,386. The Mechanical Rubber Co., Jersey City, N. J. The word *Hyd-Rex*. For machinery packing composed of rubber or rubber and fabric.
- 94,405. The Worthington Ball Co., Elyria, Ohio. The word *Arrow*. For golf balls.
- 94,406. The Worthington Ball Co., Elyria, Ohio. The word *Four*. For golf balls.
- 94,831. Robinson-Rodgers Co., Newark, N. J. An illustration of a life preserver with the word *Universal* on the outer edge and in the center a man riding the waves on an air mattress.
- 94,960. H. Malkin, Brooklyn, N. Y. The words *Baby Grand*. For shoes made of rubber, etc.

THE UNITED KINGDOM.

- 370,701. The word CONQUORER—insulating materials, packings, machine belting, brushes (except artists' brushes and brushes of metal). United States Rubber Co., Limited, London.
- 370,732. The word SYLLAN—preparation for waterproofing and preserving leather and leather goods. Samuel Cairns McNally, Glasgow.
- 370,876. The word LACTOLITH—a material made from animal substances. The British Casein Co., Limited, London.
- 370,922. The word REGO—India rubber revolving heels. Samuel Guivich & Sons, London.
- 370,945. The word NOXALITE—asbestos sheeting and washers made therefrom. J. B. Auto Specialties Co., Limited, Croydon, Surrey.
- 372,090. The word RONOLERE—water bottles and air and water beds, cushions and pillows made of rubber. Sangen, London.
- 371,177. The word PRESOLITE—accumulator boxes of non-inflammable material for railway carriages and other vehicles. British Electrical & Manufacturing Co., Limited, Newcastle-upon-Tyne.
- 371,236. The word PLUVEX—showerproof garments. McDonalds, Limited, Glasgow.
- 371,279. The word CLINCHER—all goods included in Class 8 of British Trade-marks. The North British Rubber Co., Limited, Edinburgh.
- 371,282. The word LATOCAL—material made from an animal substance. Henry Charles Dutton, Richmond.
- 371,341. The word IVOID—material made from casein. Erinoid, Limited, London.
- 371,342. The word KEYVOID—material made from casein. Erinoid, Limited, London.
- 371,343. The word ISOID—material made from casein. Erinoid, Limited, London.
- 371,372. The word ROSCOLITE—artificial leather. Rosendale Rubber Co., Limited, Manchester.
- 371,376. The word NYCELMARKET surmounting a key—rubber insulated electrical cables. Callender's Cable & Construction Co., Limited, London.
- 371,397. The word AQUATITE—air and water beds, cushions and pillows, water bottles, sheeting, cloth covers, foot-warmers, bottle stoppers and bags not for surgical or curative purposes. Thomas Rowe, Leytonstone.

- 371,413. The word PARVOU—electrical insulating compound. Oliver Matthews Row, Filton.
- 371,414. The word PETRAY—brake blocks made of rubber and canvas, canvas predominating. W. Petrie & Co., Limited, London.
- 371,474. A trade-mark the essential feature of which is the arrangement of scales and the figures and words 6 AND 30 and SIX AND THIRTY—hose of all kinds. North British Rubber Co., Limited, Edinburgh.
- *371,492. The word PARALOID—sanitary sheeting. The I. B. Kleiner Rubber Co., New York City.
- 371,529. The word SMADA—elastic hose supports and elastic arm bands. W. Y. Adams & Co., Manchester.
- 371,530. The word SMADA—elastic cords, braids and webs and elastic comest laces. W. T. Adams & Co., Manchester.
- 371,535. The word MERVEA—caoutchouc. Matthieu Gérard Jacques Marie Keschke. Timbrocan, near Bandoeng, Isle of Java, Netherlands East Indies.
- 371,574. The words SILVER KING—golf balls. The India-Rubber, Gutter-Percha & Telegraph Works, Limited, London.
- 371,605. The words BED and TREE and the letter F combined in a design of a person reclining on a bed, enclosed in a double ring—water beds and air beds of rubber and fabric. W. Petrie & Co., Limited, London.
- 371,615. The word CLINCHER—interchangeable wheels and wheel rims, ordinary wheel rims for automobiles, tire valves, tire tools and like accessories for use in connection with rubber vehicle tires. The North British Rubber Co., Limited, Edinburgh.
- *371,822. The word NYOLIN—goods manufactured from India rubber and gutta percha. The Goodyear Tire & Rubber Co., Akron, Ohio.
- 371,840. A fan with the words PUNER and BRAND—rubber goods other than dress shields. H. B. Slesman & Co., Limited, London.
- 371,857. The word FORWARD—capes. F. C. Cording & Co., Limited, London.
- 371,952. The word FORUM—balata machine belting. Mine Lubricants, Limited, London.
- 372,136. The word WACOLITE—packings, jointings and hose. Wooding & Cory, Limited, London.
- 372,309. The word PLUVEX—material for tightening and packing purposes; material for electrical insulating purposes; roofing material (pasteboard) and roofing felt. The Rubberoid Co., London.
- 372,667. The word BOLMAT—air bed made of India rubber or gutta percha, or in which such materials predominate. Thresher & Glenn, London.

DESIGNS.

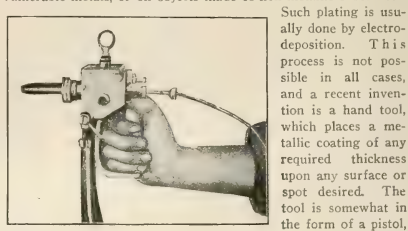
THE UNITED STATES.

- 49,090. Toy balloon. T. M. Gregory, Akron, Ohio.
- 49,121. Automobile tire. R. Iredell, assignor to The General Tire & Rubber Co.—both of Akron, Ohio.
- 49,187. Vehicle tire. C. H. Knight, Canton, Ohio.

*Denotes trade-marks owned by American Companies.

METAL SPRAY PISTOL.

For many purposes it has been found desirable to deposit a thin plating or coating of non-corrosive metal upon other more vulnerable metals, or on objects made of non-metallic substances.



and is handled in a similar manner. It is, to all intents and purposes, an atomizer of melted metal.

The metal, in the form of a thin wire, is fed into a reducing flame zone where the end is melted, a drop at a time, and each drop is struck a blow at the instant of formation, thus causing it to be ejected in the form of a molten spray. In order that this pistol may be aimed at any angle, a flexible connection is necessary between the supply of oxygen, hydrogen and air, and the pistol. This is accomplished by lines of rubber hose, made to withstand 40 pounds pressure. The device is the invention of M. C. Schoop, an engineer of Zurich, Switzerland.

Review of the Crude Rubber Market.

NEW YORK.

THE crude rubber market for the past month has been extremely quiet, with very little business other than occasional small orders for the purpose of trying out the market, and desultory trading among the local dealers. This is the quiet season when the mills usually commence to slow down for taking inventory or making necessary repairs and additions to equipment, therefore, unless something unusual happens, the large buyers have no reason to be interested in the present market.

Early in the month the reported heavy buying of futures, running into 1917, and the activity of London had a strengthening effect on the local market, resulting in firm prices. On June 1, First latex, spot and nearby, were selling for 66@66½ cents, with July-December at the same figures, and future positions during 1917 were quoted 62½ cents. Smoked sheet ribbed, spot and nearby were 65 cents; July-December 65@65½ cents, and futures for 1917 were quoted 61½ cents. Upriver fine was steady at 65 cents, and July-August deliveries were quoted at the same figures.

Extreme dullness continued to rule the local market as the month progressed and prices continued to decline to such an extent that on June 15, Upriver fine was selling at 2 cents premium over First latex. Toward the end of the month these unusual conditions, accompanied by steadily declining prices, had developed a most unsettled tone to the local market. On June 28, however, Upriver fine, spot and nearby developed considerable activity due to speculative interests coming into the market, and running the price of Upriver fine up to 67 cents. July-December was firm at 64 cents. The other Para sorts, however, are normal. On the same day First latex, spot and nearby were selling at 61 cents, with July-December at the same figures. Smoke sheet ribbed, spot and nearby, were 59½@60 cents, and July-December at the same figures. All future positions for 1917 were selling at spot quotations.

New York arrivals for the first three weeks of June are approximately 5,635 tons, as compared to 6,756 tons for the same period last month, and are as follows: Plantations from London, 2,535 tons; Singapore, 1,855 tons; Para rubber from Brazil, 645 tons; from Europe, 60 tons; Centrals, 80 tons; Guayule, 180 tons; Africans, 185 tons; Manicoba, 95 tons.

LONDON.

June opened with declining values, that continued to fall with few unimportant rallies throughout the month. June 1, Standard crepe was 62.3 cents; Smoked sheet, 60.8 cents, and Hard fine, 64.8 cents. The sensitiveness that has featured the June market has continued up to the present writing and both buyers and sellers are apparently unwilling to try the strength of the position.

The supply of crude rubber is undoubtedly unwieldy. America's demands have evidently quieted down for a time and the situation is very much like a ship in the doldrums,—something may happen at any time. On June 28, Standard crepe was 57 cents, Smoked sheet 56½ cents and Hard fine 64 cents.

SINGAPORE.

There were 1,302 tons sold at the four auctions held between May 31 and June 21 inclusive. The average price being 57.2 cents for crepe and 55.9 cents for Smoked sheet.

The following are the new freight rates from Singapore to Boston and New York via the Suez or Panama Canal:

Rubber scrap (cases).....\$36.00 per 50 cubic feet
Gutta jelutong (cases) (Pontianak)..... 39.60 per 50 cwt.
Rubber shavings, not exceeding \$300 per ton (cases) 39.60 per 50 cubic feet

Gutta re-boiled or mixed, not exceeding 24 cents

per pound (i. e. f. in cases)..... 40.80 per 50 cubic feet
Borneo rubber (baskets)..... 48.00 per 12 cwt.
Borneo, Para, and rubber, genuine (cases)..... 48.00 per 50 cubic feet
Gutta percha (cases)..... 50.40 per 50 cubic feet
Rubber, genuine (bags or bundles)..... 72.00 per 20 cwt.

The new through rate on rubber in cases from Port Swettenham, Malacca, Teluk Anson, Port Dickson, is \$51.60 per 50 cubic feet. In cases by steamers calling at Port Swettenham is \$48 per 50 cubic feet. [The equivalent of a ton (2,240 pounds) is figured at 40 cubic feet, a hundred weight (cwt.) 112 pounds.]

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and June 29, the current date:

PARA.	July 1, 1915.	June 1, 1916.	June 29, 1916.
Upriver, fine, new.....	62½@63	66 @	65 @66
Upriver, fine, old.....	63 @65	.....	.....
Islands, fine, new.....	53½@54	60 @	57 @
Islands, fine, old.....	55 @57	.....	.....
Upriver, coarse, new.....	45½@46	49 @	41½@42
Upriver, coarse, old.....	.....	.....	.....
Islands, coarse, new.....	28½@29	30 @	26 @
Islands, coarse, old.....	.....	.....	.....
Cameta.....	31½@33	34½ @	32 @
Caucho, ball, upper.....	46 @46½	49 @	42 @
Caucho, ball, lower.....	43 @44	45 @	40 @

PLANTATION.

First latex crepe	{ Spot..... 63 @	Spot..... 66½@67½	Spot..... 60 @
	{ Afloat 62½@63	July-Dec. 67 @	Futures 60 @
Amber crepe, light.....	{ Spot..... 64 @	65½@	Spot..... 58½@
	{ July-Dec. 64	.....	Futures 58½@
Brown crepe, clean.....	{ Spot..... 62 @	63½@	Spot..... 56½@
	{ July-Dec. 62	@63	Futures 56½@
Smoked sheet, ribbed	{ Spot..... 63 @	Spot..... 66 @	Spot..... 59 @
	{ Afloat 62½@63	July-Dec. 65 @	Futures 59 @
Fine sheets and biscuits, unsmoked.....	60 @61	.....	.....

CENTRALS.

Corinto.....	44 @45	42 @43	40 @
Esmeralda, sausage.....	44 @45	41 @42	40 @
Nicaragua, strap.....	.....	40 @41	40 @
Mexican plantation, sheet.....	.....	42 @43	.....
Mexican, scrap.....	44 @	39 @42	39 @
Mexican, slab.....	.....	36 @37	32 @
Manicoba.....	37 @38	44 @46½	42½@
Mangabeira, sheet.....	38 @39	39 @	40 @
Guayule.....	32 @34	38 @39	36 @
Balata, sheet.....	53 @56	70 @70½	74 @
Balata, block.....	45 @47	.....	55 @

AFRICAN.

Lopori, ball, prime.....	54 @56	64 @	58 @
Lopori, strap.....	.....	.....	.....
Upper Congo, ball, red.....	.....	62 @	54 @55
Rio Nunez Niggers.....	55 @56	63 @	54 @
Canakry Niggers.....	54 @	61 @62	50 @52
Massai, red.....	53 @54	59 @	56 @
Soudan, Niggers.....	.....	.....	48 @52
Cameroon, ball, soft.....	.....	.....	44 @51
Cameroon, ball, hard.....	.....	.....	.....
Benguela, No. 1.....	32½@33	44 @	42 @
Benguela, No. 2.....	.....	39 @	35 @
Accra, flake.....	23 @	35 @	28 @

EAST INDIAN.

Assam.....	48½@49	44 @	.....
Pontianak.....	7 @7½	74 @	84½@
Gutta Sink.....	14 @14½	25 @	14¾@
Gutta red Niger.....	.....	25 @	23 @
Boungou III.....	.....	.....	18 @20
Gutta Percha.....	1.50 @2.50	1.50 @	2.50

MARKET CABLE SERVICE FROM SINGAPORE.

The following results of the weekly auctions held at Singapore have been cabled by The Mercantile Co., Limited:

Date.	Price per lb.	Smoked Sheet.	Pounds	Sold.	Market.
May 31.....	58.4	56.5	660,800	Active lower prices.	
June 1.....	59.5	58.6	600,320	Active, good demand.	
June 10.....	55.7	54.8	672,000	Weaker.	
June 21.....	55.6	53.9	672,000	Active at lower prices.	
June 28.....	55.0	51.0	728,000	Active at lower prices.	

COMPARATIVE NEW YORK PRICES FOR JUNE.

The demand for Commercial Parag continues good, though not quite as intense the latter part of June as it has been for some months past, and the best rubber names have sold during this month at 4 to 4½ per cent, and those not so well known 5 to 5½ per cent.

	1916.*	1915.	1914.
Upriver, fine.....	\$0.62 @ 0.63	\$0.61 @ 0.63	\$0.69 @ 0.71
Upriver, coarse.....	..... 50	..... 45 @ .47	..... 40 @ .42
Islands, fine.....	..... 62	..... 53 @ .55	..... 58 @ .62
Islands, coarse.....	..... 81	..... 29 @ .31	..... 27 @ .29
Cameta.....	..... 38	..... 33 @ .33	..... 31 @ .34

*Figured only to June 26.

SINGAPORE.

GUTHRIE & CO., LIMITED, report (May 10, 1916):

Prices realized at the auction held today show a further decline, but are satisfactory when compared with London values. Standard sheet is 13½ lower at \$149, but standard crepe is only \$2 lower than last week's best. Demand was good for the latter grade, and most parcels found buyers. Out of a total of 454 tons catalogued 168 tons were sold.

The following was the course of values:

	Singapore per pound	Sterling, equivalent per pound	Equivalent per hundred pounds
Sheet, fine ribbed smoked.....	\$149 @ 149	2 5/8 @ 2 5/8	64.10 @ 66.64
Sheet, good ribbed smoked.....	135 @ 140	2 7/8 @ 2 7/8	64.10 @ 65.88
Sheet, plain smoked.....	135 @ 138	2 7/8 @ 2 7/8	63.47 @ 65
Sheet, ribbed unsmoked.....	137 @ —	2 8/8 @ —	56.76 @ 64.10
Sheet, plain unsmoked.....	117 @ 135	2 11/8 @ 2 7/8	70.95 @ 74.75
Crepe, fine pale.....	150 @ 159	2 11/8 @ 2 11/8	66.13 @ 70.95
Crepe, good pale.....	139 @ 150	2 8/8 @ 11	66.13 @ 70.95
Crepe, fine brown.....	125 @ 133	2 5/8 @ 2 7/8	60.31 @ 63.60
Crepe, good brown.....	115 @ 129	2 5/8 @ 2 5/8	56.08 @ 62.08
Crepe, dark.....	107 @ 125	2 5/8 @ 2 5/8	52.70 @ 60.31
Crepe, lark.....	83 @ 90	1 7/8 @ 1 7/8	42.57 @ 45.35
Scrap, virgin.....	83 @ —	1 9/8 @ —	43.57 @ —
Scrap, pressed.....	83 @ —	1 9/8 @ —	43.57 @ —
Scrap, loose.....	60 @ 82	1 4/8 @ 1 4/8	32.68 @ 42.06

*Pound = 133.33 pounds.

*Figured at standard rate of exchange, 1s. = 24.3 cents.

Quoted in S. S. dollars = 2/4 [56.7 cents].

CRUDE RUBBER ARRIVALS AT THE PORT OF NEW YORK.

[The Figures Indicate Weights in Pounds.]

MAY 18—By the steamer *Acre* from Pará and Manáos:

	Fine.	Medium.	Coarse.	Cauchó.	Total.
Meyer & Brown.....	106,700	18,400	124,100	66,300	315,500
Arnold & Zeiss.....	79,400	5,300	76,200	500	152,400
General Rubber Co.....	48,200	7,700	3,000	22,000	80,900
A. D. Straus & Co.....	52,000	.....	7,600	1,900	61,500
G. Amsinck & Co.....	30,700	3,600	27,300	46,400	108,000

PARAS.

	Pounds.
May 26—By the <i>Afrance</i> Colon:	
G. Amsinck & Co. (Fine).....	6,000
G. Amsinck & Co. (Coarse).....	1,500
Neuss, Hessel & Co. (Fine).....	12,500
Neuss, Hessel & Co. (Coarse).....	2,000
JUNE 5—By the <i>Orizaba</i> , Buenos Aires:	
Müller, Schall & Co. (Fine).....	72,000
Müller, Schall & Co. (Coarse).....	5,000
JUNE 8—By the <i>Panama</i> , Colon:	
G. Amsinck & Co.....	1,500
JUNE 17—By the <i>Corona</i> , Parray Cabello:	
General Export & Commission Co. (Fine).....	30,000
General Export & Commission Co. (Coarse).....	10,000

CENTRALS.

[*This sign, in connection with imports of Central, denotes Guayule rubber.]

	Pounds.
May 23—By the <i>Calamarez</i> , Port Limon:	
Isaac Brandon & Bros.....	1,000
MAY 23—By the <i>Trinidad</i> , Galveston:	
Various.....	*56,000
MAY 27—By the <i>Siroala</i> , Cortes:	
Legros & Henion.....	500
G. Amsinck & Co.....	200
MAY 29—By the <i>Esperanza</i> , Mexico:	
J. A. Medina & Co.....	500
G. Schaumann & Co.....	200
American Trading Co.....	2,500
H. Marquardt & Co.....	500
Harburger & Stack.....	24,000

Forbes Bros.....	5,400	9,500	18,600	1,300	45,800
H. A. Aslett & Co.....	2,600	.....	5,100	16,500	26,600
Henderson & Korn.....	.....	5,900	13,000	1,100	20,000
H. C. Kupper.....	.....	.....	.....	14,500	14,700
Müller, Schall & Co.....	7,500	.....	200	100	8,200
Aldens' Successors, Ltd.....	150	.....	3,300	1,000	8,250
Henderson & Korn.....	23,800	5,700	6,400	33,600	67,000
Robinson & Co.....	6,700	.....	.....	.....	6,700
Totals.....	352,450	59,000	242,800	218,400	915,550

MAY 31—By the steamer *Francis* from Pará and Manáos:

Meyer & Brown.....	37,100	17,700	25,800	20,600	105,200
Pell & Dumont.....	3,800	600	55,800	45,500	105,700
General Rubber Co.....	66,100	7,500	23,000	4,900	98,700
Arnold & Zeiss.....	16,800	2,000	16,000	53,000	88,000
H. A. Aslett & Co.....	16,700	17,400	16,000	31,700	81,800
Henderson & Korn.....	25,800	4,200	2,700	.....	32,700
Paul Bernick.....	23,000	.....	1,500	.....	24,500
Robinson & Co.....	2,000	.....	9,700	.....	11,700
Aldens' Successors, Ltd.....	300	2,200	5,200	200	7,900
F. B. Ross & Co.....	.....	.....	7,500	.....	7,500
W. R. Grace & Co.....	4,300	400	.....	.....	4,700
Totals.....	195,900	51,700	164,300	156,100	568,000

MAY 31—By the steamer *Georgy* from Lquitos:

	Per pound	Per hundred pounds
W. R. Grace & Co.....	2,200	2,200
G. Amsinck & Co.....	2,400	2,100
H. C. Kupper.....	2,600	3,600
H. A. Aslett & Co.....	4,700	11,800
Totalede Importing Co.....	300	3,300
Totals.....	13,900	9,000

JUNE 14—By the steamer *Justin* from Pará and Manáos:

Meyer & Brown.....	20,800	10,600	70,100	1,400	152,900
Paul Bernick.....	95,700	24,900	64,400	121,600	506,600
Arnold & Zeiss.....	50,700	8,500	63,700	32,600	161,500
W. R. Grace & Co.....	36,800	2,800	21,800	79,300	160,700
General Rubber Co.....	70,100	8,600	7,400	.....	86,100
Henderson & Korn.....	20,300	4,000	15,700	700	56,000
H. A. Aslett & Co.....	20,000	6,800	22,600	9,100	48,100
J. T. Johnstone & Co.....	.....	.....	43,000	43,000	86,000
Pell & Dumont.....	19,800	.....	6,000	11,000	36,800
Robinson & Co.....	200	.....	24,500	800	25,500
G. Amsinck & Co.....	5,400	400	9,100	.....	14,900
Rumsey & Goulet, Inc.....	10,200	.....	.....	.....	10,200
Aldens' Successors, Ltd.....	700	.....	2,900	200	4,100
Totals.....	610,200	66,900	208,200	299,700	1,285,000

JUNE 5—By the steamer *Tapias* from Pará and Manáos:

Meyer & Brown.....	14,300	700	88,100	9,500	112,600
Paul Bernick.....	391,000	6,600	12,400	179,300	589,300
Crossman & Sienken.....	195,400	28,100	67,300	102,500	393,300
Arnold & Zeiss.....	59,000	5,900	75,300	1,200	142,100
General Rubber Co.....	94,500	8,900	7,200	14,300	124,900
H. C. Kupper.....	56,400	7,200	16,500	21,500	104,600
Neuss, Hessel & Co.....	10,800	5,200	.....	.....	16,000
Henderson & Korn.....	23,300	5,700	30,600	2,500	62,100
G. Amsinck & Co.....	24,700	700	10,800	13,800	50,000
H. A. Aslett & Co.....	6,800	400	15,300	17,300	40,300
F. D. Duerr & Co.....	22,500	.....	900	15,400	38,800
J. T. Johnstone & Co.....	.....	.....	16,000	16,000	32,000
Müller, Schall & Co.....	3,300	.....	3,300	11,900	19,000
Birdsboro & Co.....	500	.....	5,600	800	6,900
Guaranty Trust Co.....	35,600	.....	11,300	.....	46,900
Guaranty Trust Co.....	14,700	.....	3,800	2,900	21,500
Various.....	33,900	3,400	8,100	.....	45,400
Totals.....	1,026,800	67,600	371,800	406,100	1,872,300

MAY 31—By the *Tenares*, East Limon:

	Pounds.
A. A. Lande & Co.....	1,000
JUNE 2—By the <i>Cardinal</i> , Port Limon:	
G. Amsinck & Co.....	15,400
A. M. Capen's Sons.....	11,600
Mecke & Co.....	8,300
Pablo Calvet & Co.....	3,100
H. Mann & Co.....	2,800
Pon, Nephrad & Co.....	8,000
Porter, Belling & Co.....	2,600
I. S. Sembrado & Co.....	1,800
Gontard & Co.....	1,300
H. Wolf & Co.....	1,000
Viduarque Bros. & Co.....	500
Isaac Brandon & Bros.....	500
JUNE 3—By the <i>Santa Maria</i> , Cartagena:	
Porter, Belling & Co.....	3,000
Mecke & Co.....	1,500
Müller, Schall & Co.....	500

	Pounds.
JUNE 7.—By the <i>Matapan</i> =Port Limon:	
Isaac Brandon & Bros.....	2,000
Suzarte & Whitney.....	2,000
De Lima, Contreras & Co.....	1,000
Various.....	6,000
JUNE 7.—By the <i>Id Sul</i> =Galveston:	
Various.....	*30,000
JUNE 8.—By the <i>Id Norte</i> =Galveston:	
Various.....	*75,000
JUNE 8.—By the <i>Panama</i> =Colon:	
G. Amsinck & Co.....	2,300
Muller, Schall & Co.....	1,400
Lawrence Johnson & Co.....	2,800
Andean Trading Co.....	1,900
Isaac Brandon & Bros.....	400
Harburger & Stack.....	700
Fidancie Bros. & Co.....	2,000
Pottiers, Elieging & Co.....	200
Various.....	11,700
JUNE 9.—By the <i>Idmancia</i> =Cartagena:	
A. Held.....	4,000
Andean Trading Co.....	1,200
G. Amsinck & Co.....	300
Various.....	5,500
JUNE 12.—By the <i>Idmancia</i> =Cartagena:	
G. Amsinck & Co.....	300
Eggers & Heinlein.....	200
Various.....	500
JUNE 12.—By the <i>Idmancia</i> =Mexico:	
E. Steiger & Co.....	27,000
J. A. Melina & Co.....	4,000
Graham, Hinckley & Co.....	1,000
General Export & Commission Co.....	1,000
Thurston & Braidich.....	3,000
H. W. Catlin.....	1,000
Pedro Tremari, Successor.....	1,000
W. A. Ans & Co.....	500
C. C. Mengel Bros.....	200
Various.....	37,900
JUNE 13.—By the <i>Pastores</i> =Port Limon:	
H. Marquardt & Co.....	2,500
Frut Dispatch.....	1,500
Isaac Brandon & Bros.....	1,500
Various.....	5,500
JUNE 15.—By the <i>Zapaca</i> =Cartagena:	
G. Amsinck & Co.....	6,000
American Trading Co.....	1,500
H. Wolf & Co.....	500
Various.....	8,000
JUNE 16.—By the <i>El Cid</i> =Galveston:	
Various.....	*20,000
JUNE 19.—By the <i>Norden</i> =Mexico:	
W. R. Grace & Co.....	17,000
Harburger & Stack.....	5,000
G. Amsinck & Co.....	1,000
Graham, Hinckley & Co.....	1,000
Various.....	24,000
JUNE 20.—By the <i>Calamarea</i> =Port Limon:	
A. A. Linde & Co.....	1,000
Suzarte & Whitney.....	1,000
Isaac Brandon & Bros.....	500

AFRICANS.

MAY 31.—By the <i>Orduna</i> =Liverpool:	
Arnold & Zeiss.....	11,200
H. A. Sallet & Co.....	7,000
General Rubber Co.....	6,000
Rubber Trading Co.....	2,240
Various.....	26,440
JUNE 1.—By the <i>Chicago</i> =Bordeaux:	
Robert Badenhop Co.....	30,000
JUNE 2.—By the <i>Celtic</i> =Liverpool:	
Edward Maurer & Co., Inc.....	6,000
JUNE 3.—By the <i>Argryfe</i> =London:	
J. T. Johnstone & Co.....	7,000
JUNE 12.—By the <i>Valeria</i> =Liverpool:	
Goodyear Tire & Rubber Co.....	60,000
Edward Maurer & Co., Inc.....	100,000
Various.....	160,000
JUNE 12.—By the <i>Buffalo</i> =Hull:	
J. T. Johnstone & Co.....	45,000
JUNE 19.—By the <i>Montebello</i> =Hull:	
Arnold & Zeiss.....	7,500
JUNE 19.—By the <i>Quebra</i> =Liverpool:	
Goodyear Tire & Rubber Co.....	78,000
Edward Maurer & Co., Inc.....	40,000
Various.....	118,000
JUNE 20.—By the <i>Penitence</i> =Havre:	
Robert Badenhop Co.....	2,200

MANICORA.

JUNE 9.—By the <i>Cavova</i> =Bahia:	
Adolph Hirsch & Co.....	52,000
JUNE 14.—By the <i>Justin</i> =Parnahyba:	
Rossbach Bros. & Co.....	40,000
JUNE 14.—By the <i>Justin</i> =Pernambuco:	
Rossbach Bros. & Co.....	55,000

JUNE 14.—By the <i>Justin</i> =Bahia:	
Rossbach Bros. & Co.....	12,500
F. B. Ross & Co.....	6,000
Various.....	18,500
JUNE 19.—By the <i>Rio de Janeiro</i> =Bahia:	
Adolph Hirsch & Co.....	18,500
JUNE 19.—By the <i>Rio de Janeiro</i> =Pernambuco:	
Lawrence Johnson & Co.....	5,500
Various.....	5,500
PLANTATIONS.	
MAY 24.—By the <i>Minschahn</i> =London:	
Meyer & Brown.....	20,000
Edward Maurer & Co., Inc.....	70,000
F. Stern & Co.....	33,500
Raw Products Co.....	25,000
General Rubber Co.....	380,000
Various.....	578,500
MAY 26.—By the <i>Bucara</i> =Colombo:	
Meyer & Brown.....	131,000
L. Littlejohn & Co.....	162,600
Goodyear Tire & Rubber Co.....	22,500
I. T. Johnstone & Co.....	23,000
Henderson & Korn.....	27,000
Arnold & Zeiss.....	30,000
Edward Maurer & Co., Inc.....	9,000
Various.....	405,100
MAY 30.—By the <i>Santa Rosa</i> =Colombo:	
Meyer & Brown.....	103,000
L. Littlejohn & Co.....	134,200
Goodyear Tire & Rubber Co.....	28,000
I. T. Johnstone & Co.....	34,000
Henderson & Korn.....	25,000
Various.....	324,200
MAY 29.—By the <i>Indragiri</i> =Singapore:	
Meyer & Brown.....	13,500
Edward Maurer & Co., Inc.....	7,000
I. Stern & Co.....	4,500
Charles T. Wilson Co., Inc.....	3,500
Aldens' Successors, Ltd.....	94,000
Henderson & Korn.....	17,000
Goodyear Tire & Rubber Co.....	17,000
Arnold & Zeiss.....	1,500
F. B. Ross & Co.....	11,300
I. T. Johnstone & Co.....	182,000
L. Littlejohn & Co.....	67,533
Various.....	614,953
MAY 31.—By the <i>Orduna</i> =Liverpool:	
Arnold & Zeiss.....	12,500
Various.....	12,500
MAY 31.—By the <i>Mongcha</i> =London:	
General Rubber Co.....	340,000
Goodyear Tire & Rubber Co.....	112,000
Edward Maurer & Co., Inc.....	45,000
L. Littlejohn & Co.....	189,434
Various.....	686,334
JUNE 1.—By the <i>St. Patrick</i> =Singapore:	
Meyer & Brown.....	45,000
Edward Maurer & Co., Inc.....	45,000
Boston Insulated Wire & Cable.....	4,500
L. Littlejohn & Co.....	254,664
Arnold & Zeiss.....	110,000
W. R. Grace & Co.....	45,000
Robert Badenhop Co.....	37,000
Charles T. Wilson Co., Inc.....	27,000
Goodyear Tire & Rubber Co.....	32,000
Raw Rubber Co.....	4,500
J. T. Johnstone & Co.....	138,000
Various.....	702,664
JUNE 3.—By the <i>Argryfe</i> =London:	
Meyer & Brown.....	165,000
Edward Maurer & Co., Inc.....	22,500
W. H. Stiles & Co.....	22,500
The B. F. Goodrich Co.....	22,500
Aldens' Successors, Ltd.....	236,400
I. T. Johnstone & Co.....	183,000
L. Littlejohn & Co.....	64,300
Michelin Tire Co.....	45,000
Charles T. Wilson Co., Inc.....	70,000
Henderson & Korn.....	35,000
Robinson & Co.....	25,000
Various.....	1,113,847
JUNE 6.—By the <i>Argorm</i> =London:	
J. T. Johnstone & Co.....	22,500
Various.....	22,500
JUNE 8.—By the <i>Egremont Castle</i> =Singapore:	
Meyer & Brown.....	47,000
Arnold & Zeiss.....	20,000
Edward Maurer & Co., Inc.....	52,000
Charles T. Wilson Co., Inc.....	36,000
Fox & Co.....	45,000
Raw Products Co.....	2,000
Aldens' Successors, Ltd.....	23,400
F. B. Ross & Co.....	11,200
Rubber Trading Co.....	19,000
Henderson & Korn.....	33,500
Goodyear Tire & Rubber Co.....	185,000
I. T. Johnstone & Co.....	98,000
L. Littlejohn & Co.....	177,208
Robinson & Co.....	22,500
Various.....	33,500
Various.....	992,628
JUNE 9.—By the <i>Siberia</i> =London:	
General Rubber Co.....	290,000
L. Littlejohn & Co.....	28,640
Charles T. Wilson Co., Inc.....	100,000
Various.....	488,646

JUNE 9.—By the <i>Headley</i> =London:	
Meyer & Brown.....	7,000
Edward Maurer & Co., Inc.....	33,500
W. H. Stiles & Co.....	30,000
General Rubber Co.....	265,000
The B. F. Goodrich Co.....	200,000
Aldens' Successors, Ltd.....	223,000
Arnold & Zeiss.....	170,000
I. T. Johnstone & Co.....	34,000
Rubber Trading Co.....	10,080
Charles T. Wilson Co., Inc.....	22,500
Robinson & Co.....	13,500
Various.....	1,197,580
JUNE 12.—By the <i>Idmancia</i> =Liverpool:	
General Rubber Co.....	6,000
JUNE 15.—By the <i>Minnesota</i> =London:	
Henderson & Korn.....	11,200
L. Littlejohn & Co.....	22,285
F. Stern & Co.....	50,000
Various.....	83,485
JUNE 16.—By the <i>Indragiri</i> =Singapore:	
Meyer & Brown.....	35,000
Edward Maurer & Co., Inc.....	80,000
General Rubber Co.....	385,000
Aldens' Successors, Ltd.....	45,800
H. R. Jeffers.....	14,000
Charles T. Wilson Co., Inc.....	112,000
Arnold & Zeiss.....	22,500
Fox & Co.....	27,000
Robinson & Co.....	1,100
Rubber Trading Co.....	40,320
Henderson & Korn.....	290,000
Goodyear Tire & Rubber Co.....	360,000
I. T. Johnstone & Co.....	34,000
L. Littlejohn & Co.....	215,339
Various.....	2,017,059
JUNE 19.—By the <i>St. Louis</i> =Liverpool:	
Charles T. Wilson Co., Inc.....	4,500
Various.....	4,500
JUNE 19.—By the <i>Pannonia</i> =London:	
Meyer & Brown.....	35,000
Edward Maurer & Co., Inc.....	22,500
W. H. Stiles & Co.....	22,500
The B. F. Goodrich Co.....	22,500
General Rubber Co.....	290,000
Aldens' Successors, Ltd.....	268,600
I. T. Johnstone & Co.....	361,000
Arnold & Zeiss.....	34,000
Michelin Tire Co.....	80,000
Charles T. Wilson Co., Inc.....	80,000
Raw Products Co.....	4,500
L. Littlejohn & Co.....	37,207
Robinson & Co.....	6,000
Various.....	2,148,807

CRUDE RUBBER ARRIVALS AT SEATTLE.

[The Figures Indicate Weights in Pounds.]
*Figures in brackets not to the case.

PLANTATION.

TO AKRON.

MAY 26.—By the steamer <i>Talthibius</i> :	
Consignee.....	
Firestone Tire & Rubber Co.....	
The Watchtowers.....	206,700
J. T. Johnstone & Co.....	
Hevea Johore Rubber Plantation.....	5,460
Goodyear Tire & Rubber Co.....	224,510
Henderson & Korn.....	224,510
Anglo Malay Rubber Co.....	56,330
Guthrie & Co.....	24,180
Duff Development Co.....	15,880
Rubber Estates Johore.....	14,410
Anglo Sumatra Rubber Co.....	5,330
Tamang Rubber Estates Co.....	3,380
United Serdang Rubber Plantation.....	3,250
Banjar Sumatra Rubber Co.....	2,080
Serdang Rubber Plantation.....	2,080
Ltd.....	560,270

TO NEW YORK.

United States Rubber Co.....	
General Rubber Co.....	386,230
Aldens' Successors, Ltd.....	
G. H. Sill & Co.....	8,320
Charles T. Wilson Co., Inc.....	
Insulinie Rubber and Tobacco Estate.....	3,120
J. T. Johnstone & Co.....	
Duff Development Co.....	8,880
Anglo Sumatra Rubber Co.....	2,860
Henderson & Korn.....	
United Serdang Rubber Plantation.....	1,690
Arnold & Zeiss.....	
Veller & Co.....	307,710
C. W. Mackie & Co.....	31,850
United Serdang Rubber Plantation.....	4,290
W. Mansfield & Co.....	4,160
Tandjong Rubber Co., Ltd.....	2,730
Edward Maurer & Co., Inc.....	2,640
C. W. Mackie & Co.....	47,060

	POUNDS.		POUNDS.		POUNDS.	VALUE.
W. R. Grace & Co.		Charles T. Wilson Co., Inc.		Beltling, hose, etc.		\$25,290
Guthrie & Co.	43,550	Pilmor Rubber Co.	7,280	Auto-motive tires		482,350
Fox & Co.		Whittall & Co.	3,640	Manufactures of india rubber		105,334
Weller & Co.	21,190	Clovelly Rubber Estate.	2,730	Total		\$699,532
L. Littlejohn & Co.		Alidens' Successors, Ltd.	6,370	PORT OF BOSTON—MAY, 1916.		
United Serdang Rubber Plan-	7,930	Glenshiel Rubber Estate.	3,250	Imports:		
Arthur Meyer & Co.		United Serdang Rubber Plan-	2,340	India rubber	21,286	\$15,506
Inland Rubber & Tobacco		tation		Rubber scrap	96,107	42,959
Estate	3,120	Henderson & Korn.		Manufactures of india rubber		2,871
TO SEATTLE.		United Serdang Rubber Plan-	9,620	Totals	117,393	\$61,336
The B. F. Goodrich Co.		J. T. Johnstone & Co.		Exports:		
W. T. Easley	228,670	Cumberbatch & Co.	3,640	India rubber boots (pairs)	16,979	\$38,342
Adamson, Gelliflow & Co.	79,950	Anglo Sumatra Rubber Co.	2,860	India rubber shoes (pairs)	55,967	21,307
Goodyear Tire & Rubber Co.		Arnold & Zeiss.		Rubber scrap	775	239
C. W. Mackie & Co.	168,350	Weller & Co.	63,570	Automotive tires		58,004
Sungei Puren Rubber Co.	6,240	C. W. Mackie & Co.	36,400	Other rubber tires		4,382
Planters Stores & Agency Es-		United Serdang Rubber Plan-	4,420	Beltling, hose, etc.		4,382
tate	4,420	tation	2,730	All other manufactures of		36,886
Cheras Rubber Estate	3,770	L. Littlejohn & Co.		India rubber		\$159,212
W. R. Grace & Co.		C. W. Mackie & Co.	54,470	Total		
Guthrie & Co.	22,100	Cumberbatch & Co.	4,420	PORT OF CHICAGO—APRIL, 1916.		
R. T. Reed & Co.	11,830	Whittall & Co.	3,640	Imports:		
Caesar & Co., Ltd.	11,440	A. A. Anthony & Co.	2,990	Rubber scrap	35,713	\$2,765
Geo. Stuart & Co.	4,160	Arthur Meyer & Co.	18,850	Gutta jelutong (Pontianak).		1,050
W. Mansfield & Co.	2,990	Guthrie & Co.	6,500	Totals	35,713	\$3,815
Cheras Rubber Estate	2,470	Adamson, Gelliflow & Co.	1,820	PORT OF CHICAGO—MAY, 1916.		
Sungei Puren Rubber Co.	1,300	Port Dickson Rubber Estate.	1,690	Imports:		
L. Littlejohn & Co.		TO SEATTLE.		Gutta jelutong (Pontianak).		\$408
United Serdang Rubber Plan-	3,250	The B. F. Goodrich Co.	150,930	PORT OF CLEVELAND—MAY, 1916.		
tation	550,940	W. R. Grace & Co.		Imports:		
TO AKRON.		Guthrie & Co.	20,280	India rubber	462,833	\$339,159
JUNE 3.—By the steamer <i>Mexico Maru</i> .		Whittall & Co.	11,830	Rubber scrap	111	8
Consignee—		Planters Stores & Agency Co.	9,700	Totals	462,944	\$339,167
The B. F. Goodrich Co.	173,680	T. R. Reid & Co.	6,110	Exports:		
W. T. Easley		Whittall & Co.	4,550	Reclaimed rubber	45,425	\$3,974
TO NEW YORK.		W. Mansfield & Co.	2,860	Manufactures of india rubber		41
Henderson & Korn.		Sandilands, Buttery & Co.	1,950	Totals	45,425	\$4,015
International Trading Co.	111,540	Goodyear Tire & Rubber Co.	29,250	PORT OF HUCON—MAY, 1916.		
Charles T. Wilson Co., Inc.	27,300	Cumberbatch & Co.	8,840	Imports:		
Robert Radenhop Co.		Planters Stores & Agency Co.	4,420	Rubber scrap	15,950	\$136
H. S. Godwin	20,670	Buket Cloth Rubber Co.	3,640	Exports:		
TO SEATTLE.		L. Littlejohn & Co.		Rubber scrap	7,762	\$587
JUNE 13.—By the steamer <i>Grena</i> .		The Mahawale Tea & Rubber	6,890	Reclaimed rubber	47,505	8,354
Consignee—		Chempul Rubber Estate	4,680	India rubber boots (pairs)		2,295
The B. F. Goodrich Co.	367,250	Sungei Haru Rubber Estate.	3,516	Automotive tires		2,445
J. T. Johnstone & Co.		United Serdang Rubber Plan-	3,250	Other rubber tires		2,303
McAlister & Co., Ltd.	134,420	tation	256,272,696	Beltling, hose, etc.		96
Henderson & Korn.		TO AKRON.		All other manufactures of		4,771
Charles T. Wilson Co., Inc.	16,380	JUNE 17.—By the steamer <i>Tokai Maru</i> .		India rubber		4,771
F. W. Barton & Co.	3,900	Consignee—		Totals	55,271	\$20,851
L. Littlejohn & Co.		The B. F. Goodrich Co.	223,990	PORT OF NEW YORK—APRIL, 1916.		
Paterson, Simons & Co.	124,150	TO SAN FRANCISCO.		Imports:		
Sembian Estates	6,760	JUNE 15.—By the steamer <i>Kamakura Maru</i> .		India rubber	19,885,235	\$12,902,100
Goodyear Tire & Rubber Co.		Consignee—		Isiata	256,774	108,139
Boustead & Co.	19,240	Goodyear Tire & Rubber Co.	7,280	Gutta percha	136,770	16,559
Sembian Estates	4,420	Cumberbatch & Co., Ltd.		Gutta jelutong (Pontianak).	1,378,475	65,058
W. R. Grace & Co.		GUTTA JELUTONG.		Rubber scrap	607,538	65,028
Penang Rubber Estate	11,050	TO SEATTLE.		Totals	22,264,882	\$13,157,064
Sandilands, Buttery & Co.	10,400	May 26.—By the steamer <i>Taitkybus</i> .		Exports:		
TO SAN FRANCISCO.		William Brands Sons & Co.		India rubber	26,790	\$13,089
W. R. Grace & Co.		Katz Bros.	99,060	Rubber scrap	159,477	21,179
Sandilands, Buttery & Co.	96,200	TO SAN FRANCISCO.		Totals	186,267	\$34,268
Fox & Co.		JUNE 13.—By the steamer <i>Grena</i> .		PORT OF NEW ORLEANS—MAY, 1916.		
Sandilands, Buttery & Co.	8,320	Consignee—		Imports:		
TO AKRON.		S. I. Jones & Co.	5,200	India rubber	43,096	20,779
JUNE 16.—By the steamer <i>Tenzer</i> .		Paterson, Simons & Co.		PORT OF SAN FRANCISCO—MAY, 1916.		
Consignee—		TO SEATTLE.		Imports:		
Firestone Tire & Rubber Co.	87,360	L. Littlejohn & Co.	266,240	India rubber	949,433	\$618,751
The Waterhouse Co.	23,400	Katz Bros.	666,755	Gutta jelutong (Pontianak).	54,243	2,702
J. T. Johnstone & Co.		Paterson, Simons & Co.	206,180	Totals	1,003,676	\$621,453
Merliman Rubber Estate.	19,240	Dexter Horton National Bank.		PORT OF SEATTLE—APRIL, 1916.		
Harris & Crossfield.	9,230	Hienbach Bros. & Co.	103,350	Imports:		
Pelmadulla Rubber Co.	8,580	Jagger & Co.	52,390	India rubber	2,411,745	\$1,620,897
Latex Ltd.	8,190	Adamson, Gelliflow & Co.	46,280	Gutta percha	67,774	8,169
Selangor Rubber Co.	7,280	Boustead & Co.	102,180	Gutta jelutong (Pontianak).	2,385,005	131,341
Guthrie & Co.	5,590	TO SEATTLE.		Totals	4,864,524	\$1,760,407
Adamson, Gelliflow & Co.	3,640	JUNE 13.—By the steamer <i>Grena</i> .		Exports:		
Paterson, Simons & Co.	2,860	Consignee—		India rubber shoes (pairs)	962	\$529
Signiting Rubber Estate	2,690	L. Littlejohn & Co.	69,680	Automotive tires		12,594
Censhiel Rubber Estate	2,470	Katz Bros.		Other rubber tires		1,024
Buket Lentang Rubber Estate.	2,210	GUTTA SIAK.		All other manufactures of		12,582
Goodyear Tire & Rubber Co.		TO SEATTLE.		India rubber		\$36,729
Harris & Crossfield.	177,840	JUNE 13.—By the steamer <i>Grena</i> .		Total		
Guthrie & Co.	31,850	L. Littlejohn & Co.	63,960	PORT OF SEATTLE—MAY, 1916.		
W. Mansfield & Co.	11,830	Paterson, Simons & Co.		Imports:		
The Rubber Estates	5,330	TO SEATTLE.		India rubber	5,257,146	\$4,027,114
United Sunn Rubber Co.	3,120	Consignee—		Gutta percha	77,280	10,046
Glenshiel Rubber Estate	2,470	L. Littlejohn & Co.		Gutta jelutong (Pontianak).	614,020	35,088
Port Dickson Lukut Rubber		Katz Bros.		Totals	5,948,446	\$4,072,248
Estate	1,990	JUNE 13.—By the steamer <i>Grena</i> .		PORT OF BOSTON—APRIL, 1916.		
Komhak Rubber Co.	1,560	Consignee—		Exports:		
TO BOSTON.		Paterson, Simons & Co.		India rubber boots (pairs)	3,544	\$66,755
Hood Rubber Co.		TO SEATTLE.		India rubber shoes (pairs)	34,185	19,803
Jugra Estates	4,680	JUNE 13.—By the steamer <i>Grena</i> .		Totals		
The Glenshiel Rubber Estate.	2,470	Consignee—		CUSTOM HOUSE STATISTICS.		
TO NEW YORK.		Paterson, Simons & Co.		PORT OF BOSTON—APRIL, 1916.		
United States Rubber Co.		Exports:		Imports:		
General Rubber Co.	122,590	India rubber boots (pairs)	3,544	India rubber	5,257,146	\$4,027,114
W. Mansfield & Co.	13,000	India rubber shoes (pairs)	34,185	Gutta percha	77,280	10,046
		India rubber shoes (pairs)	34,185	Gutta jelutong (Pontianak).	614,020	35,088

PLANTATION RUBBER FROM THE FAR EAST.

TOTAL EXPORTS FROM MALAYA.

(From January 1, 1915, to dates named. Re-exported by Batavia & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

	From Siam	From Malacca	From Federated States	From Siam Secret Territory	Totals.
Jan. 1, 1915	1,200,267	31,196	26,191	1,267,654	
Jan. 1, 1916	1,200,267	31,196	26,191	1,267,654	
Feb. 1, 1916	1,200,267	31,196	26,191	1,267,654	
March 1, 1916	1,200,267	31,196	26,191	1,267,654	
April 1, 1916	1,200,267	31,196	26,191	1,267,654	
May 1, 1916	1,200,267	31,196	26,191	1,267,654	
June 1, 1916	1,200,267	31,196	26,191	1,267,654	
July 1, 1916	1,200,267	31,196	26,191	1,267,654	
Totals	33,937,601	1,200,267	8,214,834	7,611,104	50,963,806

For same period, 1915	15,518,077	2,100,105	7,311,197	8,986,103	34,765,482
For same period, 1916	15,848,815	2,100,105	5,988,000	8,733,149	29,669,069
For same period, 1913	3,796,298	2,100,105	3,503,067	8,525,277	17,431,647

For same period, 1915 15,518,077 2,400,105 7,311,197 9,836,103 34,765,482

For same period, 1914 8,537,515 1,267,175 5,398,000 8,733,149 24,155,839

For same period, 1913 3,376,298 3,303,067 8,532,277 17,431,642

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to May 15, 1915 and 1916. Compiled by the Ceylon Chamber of Commerce.)

	1915	1916
United States	10,636,770	10,636,770
Canada and Newfoundland	36,740	36,740
France	130,080	130,080
Russia	5,000	5,000
United Kingdom	10,077,699	7,254,410
Australia	144,588	138,900
India	600	600
Straits Settlements	116,056	116,056
Japan	164,479	72,276
Totals	13,515,812	18,994,806

(Same period 1914, 12,406,917 pounds; same period 1913, 8,083,692.)

The export figures of rubber, given in the above table for 1914, include the imports re-exported. (These amount to 1,286,109 pounds from the Straits Settlements and 263,444 pounds from India.) To arrive at the total quantity of Ceylon rubber exported for that year deduct these imports from the total exports. The figures for 1915 and 1916 are for Ceylon rubber only.

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram from Kuala Lumpur states that 3,956 tons of plantation rubber were exported from the Federated Malay States in the month of May as against 3,904 tons in April and 2,708 tons in the corresponding month last year. The total export for five months of the current year amounted to 21,967 tons, compared with 15,787 tons in 1915 and 11,544 tons in 1914.

Appended are the comparative statistics:

	1914	1915	1916
January	2,542	3,473	4,471
February	2,364	3,411	5,207
March	2,429	3,418	4,429
April	2,151	2,777	3,904
May	2,069	2,708	3,956
Totals	11,544	15,787	21,967

EXPORTS OF INDIA RUBBER FROM MANAOS DURING APRIL, 1916.

	NEW YORK.				EUROPE.				Grand Totals.
	Fine.	Medium.	Coarse.	Totals.	Fine.	Medium.	Coarse.	Totals.	
General Rubber Co. of Brazil, Ltd.	134,929	24,316	86,000	245,245	33,600	23,493	130	57,596	395,578
Tancredi Porto & Co.	59,280	2,786	24,683	86,749	123,157	72,085	27,857	223,149	262,149
Adelbert H. Alden, Ltd.	64	5,858	7,373	13,295	35,949	1,225	1	37,175	158,461
I. C. Araujo	13,832	2,694	3,188	19,714	35,241	8,574	3,007	46,822	184,461
Alfredo Martins Pereira	10,625	1,170	7,287	19,082	1,225	3,007	300	4,532	113,066
Co. M. Grossenfeldt, Ltd.	24,773	3,793	3,793	32,359	1,225	3,007	300	4,532	29,482
M. I. I. I.	2,568	4,517	9,271	16,356	2,568	4,517	9,271	16,356	22,178
C. F. F. F.	10,341	2,012	2,434	14,787	10,341	2,012	2,434	14,787	16,469
J. Carneiro da Mota	174	46	993	1,113	1,113	2,400	160	3,673	16,463
B. Levy & Co.	1,143	3,810	3,810	8,763	1,143	3,810	3,810	8,763	16,371
Suter & Co.	9,444	706	1,861	12,011	9,444	706	1,861	12,011	13,729
Armazens Andersen	9,444	706	1,861	12,011	9,444	706	1,861	12,011	16,627
Sundries	9,444	706	1,861	12,011	9,444	706	1,861	12,011	16,627
Totals	272,830	47,125	151,278	471,233	646,663	174,631	48,895	870,189	1,087,055
In transit, liquid	61,507	1,431	17,115	80,053	281,337	38,051	1,600	320,988	391,937
Totals: April, 1916	334,337	48,556	168,393	551,286	928,000	212,682	50,555	1,191,237	1,478,992
March, 1916	502,223	76,236	228,580	807,039	1,127,621	450,320	87,029	1,664,970	2,032,651
February, 1916	546,003	82,739	191,337	819,079	1,025,698	164,400	27,819	1,218,007	1,393,490
January, 1916	561,143	110,411	176,779	848,333	996,475	543,822	58,574	1,598,871	1,797,679

(Compiled by Suter & Co., Manaus.)

IMPORTS AND EXPORTS OF CRUDE AND MANUFACTURED RUBBER AT THE PORT OF NEW YORK.

IMPORTS.

	India Rubber.		Serap for Re-manufacture.		Balata.		Gutta Jelutong.		Gutta Percha.	
Week Ending -	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
May 19, 1916	7,078,350	\$4,724	292,307	\$20,863	24,328	\$9,061	.....	.....	.....	\$35
May 26, 1916	2,082,121	13,626	396,489	24,786	.....	.....	.....	.....	12,813	8,579
June 2, 1916	5,492,836	35,952	1,061,865	3,387	51,743	22,478	426,354	\$30,992	193,119	8,579
June 9, 1916	3,772,074	24,360	134,349	9,770	19,905	6,884	473,375	28,443	.....	.....
June 16, 1916	5,140,043	32,423	94,924	8,502	18,417	6,165	424,251	18,184	.....	.....

*Pounds not specified.

In addition to the above, 5,300 pounds of Gum Chile was imported from British Honduras valued at \$1,823 for the week ending May 19, 1916, also 33,492 pounds valued at \$20,710 from Canada and 1,162 pounds valued at \$299 for the week of May 26, 1916.

STRAITS SETTLEMENTS RUBBER EXPORTS.

A cablegram from the Colonial Secretary, Singapore, notifies that the export of plantation rubber from Straits Settlements ports in the month of April amounted to 4,219 tons compared with 4,481 tons in March and 4,219 tons in the corresponding month last year. The total export for the first four months of the current year amounted to 16,502 tons against 9,772 tons in 1915 and 11,544 tons in 1914. Appended are the comparative statistics:

	1914	1915	1916
January	1,703	2,741	3,359
February	1,285	2,477	4,481
March	1,348	1,978	4,219
April	.....	.....	.....
Totals	5,717	9,772	16,502

These figures include transshipments of rubber from various places in the neighborhood of the Straits Settlements such as Java, Sumatra, Borneo and the non-Federated Malay States as well as rubber actually exported from Ceylon, but not including rubber exports from the Federated Malay States.

RUBBER AND GUTTA EXPORTS FROM JAVA AND MADURA.

	January.		Two Months Ending February.	
	1942.	1943.	1942.	1943.
PLANTATION				
Holland	Peas 1,400	2,800	3,800	2,800
	Hevea 1,400	2,800	3,800	2,800
	Manihot (Ceara) 2,800	.....	3,800	.....
	Totals 5,600	5,600	10,400	5,600
Great Britain	Peas 2,800	5,600	5,600	2,800
	Hevea 1,400	2,800	3,800	2,800
	Manihot (Ceara) 1,400	2,800	3,800	2,800
	Castillo 2,800	5,600	10,400	5,600
	Totals 8,400	16,800	16,800	11,200
Singapore	Peas 1,400	2,800	3,800	2,800
	Hevea 1,400	2,800	3,800	2,800
	Manihot (Ceara) 1,400	2,800	3,800	2,800
	Castillo 1,400	2,800	3,800	2,800
	Totals 5,600	11,200	14,200	11,200
United States	Peas 2,800	5,600	5,600	2,800
	Hevea 1,400	2,800	3,800	2,800
	Manihot 1,400	2,800	3,800	2,800
	Castillo 1,400	2,800	3,800	2,800
	Totals 7,000	14,000	16,000	11,200
Australia	Peas 1,400	2,800	3,800	2,800
	Hevea 1,400	2,800	3,800	2,800
	Totals 2,800	5,600	7,600	5,600
Japan	Peas 2,800	5,600	5,600	2,800
	Hevea 1,400	2,800	3,800	2,800
	Totals 4,200	8,400	9,400	5,600
Russia	Peas 1,400	2,800	3,800	2,800
	Hevea 1,400	2,800	3,800	2,800
	Totals 2,800	5,600	7,600	5,600
	Grand Totals	805,543	1,584,691	3,614,266
GUTTA FERACA, TO—				
Singapore	.....	92,600	19,778	183,502
GUTTA JELUTONG, TO—				
Singapore	.....	.....	1,584	1,600

EXPORTS.

FIGURES ISSUED FROM MAY 24, 1916, TO

JUNE 24, 1916.

EXPORTED TO	Belting, Hose and Packing.	Footwear.		Tires.		Insulated Wire and Cables.	Other mfr. of India Rubber.	Fountain Pens.	Chewing Gum.	Reclaimed Rubber.	Scrap Rubber.
		Boots.	Shoes.	Auto.	Other.						
NORTH AMERICA											
Bermuda			\$6	\$71		\$2	\$158		\$49		
British Honduras	\$65				\$38		23	\$14			
Canada			150				379	87			
Central American States											
Costa Rica	1,210			792	1,062	236	1,953		379		
Guatemala	83		52	1,239	491		846		241		
Honduras	553			1,831	418	108	1,109		61		
Nicaragua	211						913		45		
Panama	10,550		924	10,569	8,899	32,798	4,273	263	2,179		
Salvador	388			336	71	159	3,560				
Mexico	6,482			16,504	813	4,932	4,114				\$55
Newfoundland	202	2,391	1,410	479	478	1,221	933	19	496		
West Indies—											
British—											
Barbados	35			213			2,634				
Jamaica	916			6,140	212	89	1,911	28			
Trinidad and Tobago	848			3,155	117	78	620	2			
Other British	152			386	300		538	349			
Cuba	17,139		922	99,355	10,731	23,900	38,640	425	1,955		
Danish	26		31	29	34		9	231			
Dutch	666		14	514	8	111	192	373	25		
French			14	487			32	15			
Haiti	57		1	99	48	56	621	271	44		
Santo Domingo	286		69	1,692	330		596	36			
Totals, North America	\$39,994	\$2,671	\$3,630	\$143,891	\$18,010	\$63,603	\$64,084	\$2,013	\$5,608		\$55
EUROPE											
Azores Islands							\$34				
Denmark	\$1,071			\$634	\$840	\$2,190	293				
Finland		976					69				
France	787	\$6,745	\$6,249	21,445	81,455	3,033	138,625		\$7,800		
Gibraltar	587										
Greece	6,278			250	575		736		1,378		
Italy		4		190	6,171	767	17,134	\$1,299			
Netherlands	39			291	59	2,627	1,988				
Norway	2,547		12,048	6,347		68,767	1,766				
Portugal				253	100		327	109			
Russia in Europe	4,303			1,177		321	2,146	134			
Spain				3,122		22,211	1,100	149			
Sweden				11,264			8,690				
United Kingdom—											
England	86,099	139	31,812	1,279,391	260,455	62,358	411,307	2,159	23,782	11,654	20,721
Scotland	9,770						12,449	69			2,504
Ireland				29							
Totals, Europe	\$112,967	\$6,888	\$50,114	\$1,324,531	\$349,665	\$162,184	\$596,595	\$3,919	\$32,960	\$11,654	\$23,225
SOUTH AMERICA											
Argentina	\$5,401		\$353	\$23,714	\$47,406	\$9,672	\$38,730	\$1,505	\$710	\$1,700	
Bolivia	647			403		194	888				
Brazil	22,213	\$207	3,516	57,092	6,518	45,509	40,871	668	605		
Chile	26,808		950	23,245	4,026	6,083	43,871		31		
Colombia	1,860		38	3,410	1,514	676	5,280	2	126	21,250	
Ecuador	687			854		1,096	1,448		20		
Guiana	376			176		60	352	321			
Dutch				90			3				
Peru	6,674			1,385	235	1,500	7,344		122		
Uruguay	1,345		5	3,396	3,066	5,603	3,936		190		
Venezuela	1,740		29	5,323	1,518	1,712	5,489	6	58		
Totals, South America	\$67,701	\$736	\$4,691	\$119,088	\$64,773	\$72,105	\$148,202	\$2,502	\$2,287	\$22,950	
ASIA											
Aden				\$331							
China	\$161			999		\$361	\$402				
British East Indies—											
British India	1,644			9,315	\$117	3,838	5,211	\$1,340			
Straits Settlements	140			26,410	195		89	106			
Dutch East Indies	125			\$27	4,020		6,503	65			
Hongkong									\$336		
Japan				1,943			1,284			\$4,032	
Russia in Asia						198					
Siam				817	339		6				
Totals, Asia	\$2,670		\$1,970	\$41,892	\$551	\$10,900	\$7,002	\$1,511	\$336	\$4,032	
OCEANIA											
British—											
Australia and Tasmania	\$1,310	\$25	\$3,435	\$3,113	\$498	\$5,495	\$9,494	\$531	\$3,538		
New Zealand	72			32,067	1,725	378	8,167				
British Oceania			258	2,171							
Philippine Islands	34		2,373	8,399	456	18,821	7,307	65	820		
Totals, Oceania	\$1,416	\$25	\$6,066	\$43,579	\$2,709	\$24,644	\$24,968	\$596	\$4,358		
AFRICA											
British Africa—											
West				\$69							
South	\$3,945		\$1,244	25,038	\$870	\$1,951	\$12,755		\$894		
East				2,171							
Canary Islands							81				
Egypt									450		
Madagascar				197			195				
Portuguese Africa											
Totals, Africa	\$30,645		\$1,244	\$27,475	\$870	\$1,851	\$13,031		\$1,344		

In addition to the above Balata was exported to England valued at \$20,000.

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—(free).	March, 1916.		Nine Months Ending March, 1916.	
	Pounds.	Value.	Pounds.	Value.
India rubber:				
From France	75,182	\$53,178	379,497	\$134,052
Portugal	450,221	90,017	2,440,328	\$53,084
United Kingdom	5,885,915	4,528,302	53,709,713	\$34,079,703
Central America and British Honduras	77,060	36,026	870,097	\$31,629
Mexico	904,492	314,714	2,900,082	1,095,478
Brazil	3,853,741	2,041,913	38,158,671	16,956,739
Other South America	240,437	123,337	4,608,296	2,119,743
East Indies	15,421,39	10,958,855	83,199,316	46,524,551
Other countries	3,330	1,639	67,156	429,120
Totals	27,412,637	\$17,897,081	186,973,556	\$102,764,068
Balata	265,240	107,034	2,047,071	789,278
Guayule gum	197,730	51,370	2,001,708	648,835
Gutta jelutong	1,245,566	79,862	17,700,561	738,019
Gutta percha	332,725	28,334	1,839,639	202,729
Totals	2,841,898	\$1,167,881	21,562,538	\$105,202,929
Rubber scrap and refuse	1,807,394	146,344	12,240,263	\$934,650
Totals, unmanufactured	31,156,292	\$18,310,225	223,307,798	\$116,877,579
Chicle	714,965	\$308,574	5,441,674	\$2,026,256
MANUFACTURED—(dutiable):				
Gutta percha		\$219		\$7,150
India rubber		64,266		269,417
Totals, manufactured		\$64,485		\$275,567
Substitutes—elasticon, etc.		\$1,024		\$14,499

EXPORTS OF DOMESTIC MERCHANDISE.

MANUFACTURED—	March, 1916.		Nine Months Ending March, 1916.	
	Pounds.	Value.	Pounds.	Value.
Automobile tires:				
To Russia in Europe		\$30,200		\$1,116,270
England		634,750		6,494,482
Canada		58,091		949,401
Mexico		23,643		193,962
Cuba		42,248		351,599
Australia		147,328		1,099,952
New Zealand		160,236		725,684
Philippine Islands		19,759		21,035
Other countries		310,378		2,015,473
Totals		\$1,426,023		\$13,170,878
All other tires		153,172		2,168,642
Belt, hose and packing		293,289		7,068,725
Rubber boots		47,748		621,643
Rubber shoes		154,683		84,806
Scrap and old rubber		425,711		366,629
Reclaimed rubber		669,608		95,142
Other rubber manufactures		740,294		4,798,507
Totals, manufactured		\$2,886,733		\$25,377,726
Fountain pens		15,809		\$1,326
Totals		\$1,326		\$109,623

EXPORTS OF FOREIGN MERCHANDISE.

UNMANUFACTURED—	March, 1916.		Nine Months Ending March, 1916.	
	Pounds.	Value.	Pounds.	Value.
Balata	55,784	\$27,086	399,771	\$156,671
Guayule gum			18,500	7,770
Gutta jelutong			273	405
Gutta percha	133	70	60,023	11,446
India rubber	346,121	249,294	3,618,857	2,043,563
Rubber scrap and refuse			9,204	734
Totals, unmanufactured	436,038	\$276,440	4,109,128	\$2,220,489
Chicle	49,555	\$957	111,661	\$3,743
MANUFACTURED				
Gutta percha		\$297		\$537
India rubber				\$7,113
Totals, manufactured		\$297		\$7,650

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

	March, 1916.		Nine Months Ending March, 1916.	
	Pounds.	Value.	Pounds.	Value.
To Alaska:				
Belt, hose and packing		\$11,042		\$86,123
Boots and shoes		5,092		12,149
Other rubber goods		2,082		47,688
Totals		\$25,217		\$145,959
To Hawaii:				
Belt, hose and packing		\$4,926		\$63,539
Automobile tires				\$1,613
Other tires		5,497		55,167
Other rubber goods		6,507		6,507
Totals		\$70,545		\$186,826

To Philippine Islands:

Belt, hose and packing		\$9,144		\$44,925
Boots and shoes	11	6	16,717	14,696
Other rubber goods		31,015		291,124
Totals		7,899		1,29,015
To Porto Rico:				
Totals		\$42,354		\$479,700
Belt, hose and packing		\$2,739		\$30,165
Automobile tires		23,377		274,178
Other tires		3,423		28,360
Other rubber goods		7,691		51,067
Totals		\$37,600		\$383,970

FOR QUARTER ENDING DECEMBER 31, 1915.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—(free).	Oct. 1, to Dec. 31, 1915.	
	Pounds.	Value.
Balata, crude	714,208	\$265,574
Guayule gum	111,270	98,157
Gutta jelutong	5,470,936	230,919
Gutta percha, crude	499,120	55,421
India rubber, crude	61,065,638	31,127,185
Scrap rubber	189,499	18,499
Reclaimed rubber	385,786	74,520
Totals	71,397,051	\$32,041,265
MANUFACTURED—(dutiable):		
Gutta percha	10 per cent	\$1,391
India rubber	10 per cent	86,769
Druggists' supplies of rubber	15 per cent	4,003
Hard rubber	25 per cent	3,777
Rubber stencils	15 per cent	1,764
Substitutes, elasticon, etc.	15 per cent	6,240
Totals		\$101,924
Chicle		\$105,695
Reclaimed		445,428
Totals		690,852

RUBBER STATISTICS FOR CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—(free).	March, 1916.		Twelve Months Ending March, 1916.	
	Pounds.	Value.	Pounds.	Value.
Rubber and gutta percha, crude				
From Great Britain	667,187	\$475,043	5,113,081	\$3,053,038
United States	47,763	321,042	4,545,489	2,542,260
Straits Settlements			22,574	11,659
Other countries			232,045	106,318
Totals	1,114,950	\$796,085	9,913,189	\$5,713,275
Rubber, recovered:				
From Great Britain			4,392	\$2,482
United States	510,426	\$67,761	4,835,209	\$2,886,863
Totals	510,426	\$67,761	4,839,601	\$2,889,345
Hard rubber, in sheets and rods:				
From Great Britain			2,302	\$1,404
United States	6,202	\$2,062	167,137	\$23,106
Totals	6,202	\$2,062	167,137	\$23,106
Rubber substitute:				
From Great Britain	1,341	\$1,296	29,056	\$3,108
United States	104,343	8,248	576,605	45,066
Totals	115,747	\$9,544	605,661	\$48,174
Rubber, powdered, and rubber or gutta percha waste:				
From Great Britain			7,314	\$579
United States	24,875	\$14,781	1,313,608	\$5,627
Other countries			15,594	634
Totals	24,875	\$14,781	1,336,516	\$6,840
Rubber thread, not covered:				
From United States	589	\$890	32,334	\$44,314
Balata, crude:				
From United States			1,644	\$991
Chicle, crude:				
From Great Britain			2,888	\$1,675
United States	4,923	\$2,941	2,819	\$9,923
British Honduras	141,001	\$2,126	1,274,906	\$72,211
Mexico	61,291	22,854	367,220	135,877
Totals	208,184	\$75,271	1,905,533	\$708,744

Twelve Months Ending March, 1916.

MANUFACTURED—(dutiable):	March, 1916.		Twelve Months Ending March, 1916.	
	General Tariff, Value.	Preferential Tariff, Value.	General Tariff, Value.	Preferential Tariff, Value.
Waterproof clothing:				
From Great Britain		\$20,515	\$3,454	\$332,421
United States	\$16,813		125,953	
Other countries			63	
Totals	\$16,813	\$20,515	\$129,470	\$332,421

Hose, lined with rubber:				
From Great Britain	\$7,600	\$101	\$29,108	\$646
United States	.....	.....	.....	.....
.....
Totals	\$7,600	\$101	\$29,108	\$646
Mats and matting:				
From Great Britain	.....	\$5	.....	\$126
United States	.....	.....	\$2,612	.....
.....
Totals	.....	\$5	\$2,612	\$126
Packing:				
From Great Britain	.....	\$227	\$201	\$1,436
United States	.....	.....	\$7,361	.....
.....
Totals	.....	\$227	\$7,562	\$1,436
Tires of rubber for all vehicles:				
From Great Britain	.....	\$783	\$14,805	\$26,700
United States	.....	.....	.....	.....
.....
Other countries	.....	.....	.....	.....
Totals	.....	\$783	\$14,805	\$26,700
*Rubber cement and all other manufactures of india rubber and gutta percha, N. O. P.:				
From Great Britain	.....	\$288	\$30,601	\$189,940
United States	.....	.....	.....	.....
Other countries	.....	.....	.....	.....
Totals	.....	\$288	\$30,601	\$189,940
Hard rubber, in tubes:				
From United States	.....	\$1,209	.....	\$5,585
Boots and shoes:				
From Great Britain	.....	.....	.....	\$11,558
United States	.....	.....	.....	.....
Other countries	.....	.....	.....	.....
Totals	.....	.....	.....	\$11,558
Belting:				
From Great Britain	.....	.....	.....	\$1,172
United States	.....	.....	.....	.....
Other countries	.....	.....	.....	.....
Totals	.....	.....	.....	\$1,172
Webbing—over one inch wide:				
From Great Britain	.....	\$36	\$1,611	\$104
United States	.....	.....	.....	.....
Other countries	.....	.....	.....	.....
Totals	.....	\$36	\$1,611	\$104

*In addition the imports of rubber cement and all manufactures of india rubber and gutta percha not otherwise provided for amounted to \$13 from Great Britain and \$40 from various countries for March; and \$220 from Great Britain and \$246 from various countries for the twelve months ending March, 1916, the values being at treaty rates.

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	March, 1916.		Twelve Months Ending March, 1916.	
	Prod- ucts of Canada. Value.	Re-exports of foreign goods. Value.	Prod- ucts of Canada. Value.	Re-exports of foreign goods. Value.
MANUFACTURED—(dutiable):				
Belting:				
To Great Britain	\$150	.....
United States	424	\$58
Newfoundland	\$291	1,291
Other countries	33	.....
Totals	\$291	\$1,898
Hose:				
To Great Britain	\$42,431	\$66,030
United States	1,976
Newfoundland	\$201
Other countries	2,612
Totals	\$42,810	\$90,136
Boots and shoes:				
To Great Britain	\$280,337	\$1,018,385
United States	77	3,710
Newfoundland	2,293	85,005
Australia	2,398	33,012
Other countries	867	35,302
Totals	\$286,272	\$1,175,496
Mats and matting:				
To Great Britain	\$140	\$2,687
Newfoundland	18	.....
Other countries	469
Totals	\$158	\$3,174
Clothing:				
To Great Britain	\$27
United States	44
Newfoundland	140
Other countries	238
Totals	\$61	\$449

*Rubber waste:				
To Great Britain	.....	.....	\$6,368	.....
United States	.....	.....	\$80,897	\$1,964
Totals	.....	.....	\$87,265	\$1,964
All other mfrs. N. O. P.:				
To Great Britain	.....	.....	\$110,654	\$3
United States	.....	.....	1,668	\$956,495
Newfoundland	.....	.....	463	119,936
Australia	.....	.....	253	5,438
Other countries	.....	.....	20,600	1,867
Totals	.....	.....	\$146,712	\$1,223,456
Gum chicle:				
To Great Britain	.....	.....	\$10,000	\$5,000
United States	.....	.....	146,417	\$20,000
Other countries	.....	.....	.....	\$94,887
Totals	.....	.....	\$156,417	\$122,840

*During March 576,000 pounds of rubber waste was exported to the United States, making a total of 8,718,500 pounds for the twelve months ending March, 1916. For the twelve months ending March, 1916, 60,600 pounds was exported to Great Britain.

*During March, 20,000 pounds of gum chicle was exported to Great Britain and 262,555 pounds to the United States. During the twelve months ending March, 1916, 40,000 pounds was exported to Great Britain, 1,719,429 pounds to the United States, and 61,626 pounds to various countries.

UNITED KINGDOM RUBBER STATISTICS.

	May, 1916.		Five Months Ending May, 1916.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—				
Crude rubber:				
From Dutch East Indies	1,115,800	\$750,362	3,331,200	\$2,387,928
French West Africa	88,800	\$52,211	281,600	\$198,033
Gold Coast	93,500	\$6,377	744,700	\$314,398
Other countries in Africa	731,300	381,811	3,835,800	2,050,773
Peru	201,200	122,754	804,600	\$49,287
Brazil	2,212,700	1,447,114	12,386,700	\$8,569,271
British India	280,100	191,780	1,988,100	1,508,412
Strategic Settlements and dependencies, including Labuan	3,411,200	2,450,407	24,203,300	18,316,659
Federated Malay States	3,185,700	2,537,566	12,645,000	9,582,345
Ceylon and depend-	1,267,100	880,569	9,250,800	7,117,241
Other countries	526,100	413,800	1,346,900	1,915,675
Totals	13,108,500	\$9,264,651	71,488,100	\$52,810,022
Waste and reclaimed rubber	37,800	\$30,861	2,829,500	\$317,932
Gutta percha	782,600	322,923	3,408,100	1,577,362
MANUFACTURED—				
Apparel, waterproofed	.....	\$10,745	.....	\$32,984
Boots and shoes (dozen pairs)	14,307	157,731	83,603	756,740
Insulated wire	.....	74,025	.....	241,484
Submarine cables	.....	.....	.....	30,292
Automobile tires and tubes	.....	1,501,492	.....	6,747,487
Motorcycle tires and tubes	.....	40,114	.....	192,849
Cycle tires and tubes	.....	82,775	.....	264,418
Tires not specified	.....	2,250	.....	22,827
EXPORTS.				
	May, 1916.		Five Months Ending May, 1916.	
	Pounds.	Value.	Pounds.	Value.
MANUFACTURED—				
Apparel, waterproofed:				
To France	.....	\$23,158	.....	\$146,314
British South Africa	.....	9,807	.....	77,229
British East Indies	.....	24,825	.....	63,520
Australia	.....	42,357	.....	138,965
New Zealand	.....	13,545	.....	89,387
Canada	.....	15,168	.....	82,338
Other countries	.....	121,262	.....	400,318
Totals	.....	\$260,122	.....	\$998,074
Boots and shoes (dozen pairs)	11,217	\$60,497	40,826	\$210,550
Insulated wire	.....	211,633	.....	902,365
Submarine cables	.....	74,722	.....	491,775
Automobile tires and tubes	.....	500,524	.....	1,880,263
Motorcycle tires and tubes	.....	47,920	.....	171,225
Cycle tires and tubes	.....	402,753	.....	1,312,918
Tires not specified	.....	101,716	.....	371,825
Manufactures not specified	.....	667,084	.....	2,849,667

EXPORTS—FOREIGN AND COLONIAL.

	May, 1916.		Five Months Ending May, 1916.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—				
Crude rubber:				
To Russia	1,311,700	\$1,035,073	5,891,300	\$4,549,548
France	1,096,600	856,818	7,676,100	\$6,042,912
United States	8,299,400	6,666,739	27,346,400	\$21,091,581
Other countries	1,803,500	1,375,793	8,290,500	5,951,697
Totals	12,511,200	\$9,934,423	49,304,300	\$37,641,738
Waste and reclaimed rubber	57,800	\$9,696	255,000	\$42,520
Gutta percha	75,800	44,456	266,200	141,627

MANUFACTURED—			
Apparel, waterproofed	\$78	.....	\$681
Boots and shoes, (dressed pairs)	663	.....	66,414
Insulated wire	17,637	.....	45,378
Automobile tires and tubes	507,773	.....	1,710,180
Motorcycle tires and tubes	12,283	.....	38,405
Cycle tires and tubes	37,538	.....	103,195
Tires not specified	972	.....	4,500

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED	Two Months Ending February, 1915.		Two Months Ending February, 1916.	
	Pounds.	Value.	Pounds.	Value.
India rubber and gutta percha —raw and reclaimed				
From Straits Settlements	246,620	.....	9,900	.....
African Fr. Colony .....	.....	.....	6,380	.....
Belgian Congo .....	.....	.....	66,660	.....
Brasil .....	.....	.....	17,39,860	.....
Other countries	4,920	.....	234,520	.....
Totals	611,160	\$475,408	2,047,320	\$1,257,241
Rubber scrap	7,920	\$486	526,460	\$32,329
MANUFACTURED—				
India rubber and gutta percha —sheets				
From United States	5,730	.....	8,580	.....
Great Britain .....	.....	.....	8,580	.....
Other countries .....	.....	.....	20	.....
Totals	11,880	\$18,750	17,380	\$27,445
India rubber and gutta percha —sheets				
Cut sheets	1,100	\$1,457	220	\$291
Elastic fabric	440	135	0	67
Hard rubber	1,100	675	10,560	6,485
India rubber and gutta percha —tubes				
Cut sheets	440	\$656	.....	.....
Elastic fabric				
From Austria-Hungary	220	.....	.....	.....
Germany	2,640	.....	.....	.....
Other countries	6,820	.....	1,540	.....
Totals	9,680	\$4,161	1,540	\$662
Other forms	440	\$212	1,100	\$531
Belt	10,780	\$5,674	28,160	\$14,822
Rubber coated fabrics, (pieces)	6,380	\$6,716	28,380	\$29,876
Other forms				
From Great Britain	1,760	.....	4,840	.....
Other countries	220	.....	.....	.....
Totals	1,980	\$1,303	4,840	\$3,184
Rubber boots and shoes (pairs)				
From United States	5,948	.....	6,224	.....
Austria-Hungary	1,531	.....	.....	.....
France .....	.....	.....	.....	.....
Germany	2,590	.....	.....	.....
Other countries .....	.....	.....	220	.....
Totals	10,089	\$7,789	13,725	\$10,596
Elastic webbing				
From Austria-Hungary	3,080	.....	.....	.....
France	2,640	.....	440	.....
Germany	13,640	.....	880	.....
Other countries	4,400	.....	1,100	.....
Totals	23,760	\$33,350	2,420	\$3,397
Elastic fabric (not specified)				
From Austria-Hungary	5,500	.....	.....	.....
France	1,540	.....	118,140	.....
Germany	10,440	.....	.....	.....
Great Britain	15,180	.....	20,020	.....
Other countries	1,320	.....	220	.....
Totals	33,880	\$20,805	138,380	\$84,978
Tires				
From France	3,960	.....	78,980	.....
Germany	420	.....	.....	.....
Great Britain	23,880	.....	37,620	.....
Other countries	660	.....	4,620	.....
Totals	27,940	\$34,070	121,220	\$147,817
Other rubber manufactures				
From Austria-Hungary	5,500	.....	.....	.....
France	1,320	.....	380,460	.....
Germany	33,000	.....	115,060	.....
Great Britain	26,620	.....	.....	.....
Other countries	9,900	.....	104,060	.....
Totals	76,340	\$33,482	569,580	\$249,838
Total Imports		\$545,029		\$1,869,558

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—	Two Months Ending February, 1915.		Two Months Ending February, 1916.	
	Pounds.	Value.	Pounds.	Value.
India rubber and gutta percha —raw and reclaimed	40,040	\$8,957	202,180	\$45,228

MANUFACTURED—				
India rubber and gutta percha				
—sheets.....				
To France.....	.....	.....	1,540	.....
Germany.....	5,720	.....	.....	.....
Great Britain.....	.....	.....	1,100	.....
Argentina.....	560	.....	1,320	.....
Other countries.....	3,520	.....	880	.....
Totals.....	9,900	\$15,633	4,840	\$7,643
India rubber and gutta percha				
—tubes.....				
Cut sheets.....	1,980	\$2,623	1,540	\$2,040
Elastic fabric.....	.....	303	.....	.....
Insulated wire.....	1,100	.....	260	.....
Hard rubber.....	8,800	5,404	25,300	15,536
India rubber and gutta percha				
—tubes.....				
Cut sheets.....	.....	.....	6,380	\$9,515
Elastic fabric.....	27,560	\$11,821	16,720	6,787
Other forms.....	12,320	5,944	19,800	9,553
Belt.....	440	232	.....	.....
Elastic webbing:				
To France.....	440	.....	1,540	.....
Germany.....	8,360	.....	12,320	.....
Egypt.....	.....	.....	3,300	.....
Argentina.....	4,400	.....	16,060	.....
Brazil.....	12,980	.....	13,860	.....
Cuba.....	7,260	.....	4,620	.....
Other countries.....	8,580	.....	13,640	.....
Totals.....	43,070	\$88,981	65,340	\$91,714
Tires:				
To France.....	.....	.....	27,500	.....
Great Britain.....	.....	.....	1,021,240	.....
Switzerland.....	12,660	.....	27,500	.....
India and Ceylon.....	7,700	.....	49,500	.....
Australia.....	440	.....	20,240	.....
Argentina.....	86,440	.....	79,640	.....
Brazil.....	35,640	.....	8,880	.....
Other countries.....	6,6780	.....	44,220	.....
Totals.....	77,620	\$1,137,733	1,278,420	\$1,558,917
Other rubber manufactures:				
To Switzerland.....	32,120	.....	4,180	.....
Great Britain.....	.....	.....	9,460	.....
Argentina.....	66,440	.....	16,280	.....
Other countries.....	.....	.....	36,520	.....
Totals.....	108,460	\$67,556	66,440	\$41,383
Total Exports.....	1,027,840	\$1,315,347	1,686,960	\$1,788,316

THE RUBBER SCRAP MARKET.

NEW YORK.

THE adverse conditions surrounding the local market caused a break in the price of boots and shoes early in the month of June that resulted in lower values being quoted on the other grades in the list, with some exceptions, however. The weakness in the crude rubber market, together with the fact that rubber manufacturers and reclaimers alike were anticipating a quiet summer season, and the usual period of inventories, would naturally indicate easier conditions and lower prices. Moreover, the increasing volume of scrap arrivals released by the recent freight congestion is another potent reason for the unsettled tone of the market early in June. On Saturday of the first week, boots and shoes varied from 8½ to 8¾ cents, the former price being more representative of the actual business transacted with the mills. The other grades remained practically unchanged; G. & G. tires being quoted 8½ to 8¾ cents, and mixed auto tires, 6½ cents, with little business resulting. Inner tubes were weak, the best quality was nominally quoted 27 to 28 cents delivered to the mills.

Toward the end of the month the belief was current among the large dealers that prices had reached the lowest level—a theory that was supported by a noticeable diminution in the arrivals of supplies—and therefore they were not anxious to sell. On June 28, boots and shoes were very sluggish at practically the same prices that have prevailed since the first of the month, 8½ cents delivered being the best price obtainable. Transactions in mixed auto tires were small in volume at 6¼ cents delivered, while the other grades remained unchanged. The balance of the list offered no unusual features worthy of recording, and the prevailing opinion is that for the next few weeks there will be no improvement in the rubber scrap business.

import of 15,000 tons of dyestuffs, but recovered and are now advancing. There is little doubt that price levels must be readjusted before the mills can be expected to support the market. This is their quiet season and surplus stocks will be drawn upon to tide them over the summer season.

ANILINE OIL. The market for this month has been fairly firm since the decline in May, but weakness developed later in the month, due to delay in granting export shipping permits.

ANTIMONY SULPHURETS. Antimony metal has decreased in price and the best grades of sulphurets have been affected by an inferior quality being offered at lower prices. The demand is good and sales plentiful.

BARYTES. Supplies are scarce and present prices have been maintained by heavy demand. A new, large mine is being opened in the South for the production of prime white grade.

CAUSTIC SODA. The inquiry has been moderate. The large amount of resale stock has caused the market to settle.

LITHARGE. Prices have remained firm and unchanged.

LITHOPONE. The shortage of stocks has been marked by firm prices.

SULPHURIC ACID. The production of sulphuric acid, expressed in terms of 50 degree acid, in the United States in 1915, was 3,868,152 short tons, valued at \$29,869,080, together with 189,795 short tons of oleum or fuming acid of different strengths, valued at \$2,787,971, making a total of 4,057,947 short tons, valued at \$32,657,051.

TALC. Shortage of imported talc has directed attention to the American product. Large quantities are being substituted for the French and Italian goods.

ZINC OXIDE. The New Jersey Zinc Co. has reduced the prices of three high grade brands of zinc 8 cents a pound, white seal to 17 cents, green seal to 16½ cents and red seal to 16 cents.

This is due to the fact that spelter from which these grades are made, has declined. The lower grades made from lead ore have advanced on account of the high price of the ore.

NEW YORK QUOTATIONS.

JUNE 29, 1916.

Subject to change without notice.

Acetone (drums).....	gal.	\$0.95	@ \$1.01
Acid, acetic, 28 per cent. (bbls.).....	lb.	.06	@ .06 1/4
Acrylic (crude).....	gal.	.75	@ .80
Alcohol, 95 per cent. (carboys).....	lb.	.20	@ .50
Alumina, 90 degrees.....	lb.	.02 1/2	@
Nitric, 36 degrees.....	lb.	.06	@
Sulphuric, 60 degrees.....	lb.	.06	@
Alumina Pigment, No. 1 (casks).....	ton	15.00	@
Aluminum Flake (carloads).....	ton	22.00	@
Antimony carbamate.....	lb.	.09 1/2	@ .10
Antimony, crimson, sulphuret of (casks).....	lb.	.75	@
crimson, "Mephisto" (casks).....	lb.	.75	@
golden, sulphuret of (casks).....	lb.	.40	@ .60
golden, "Mephisto".....	lb.	.35	@
golden, sulphuret, States brand, 16-17 per cent. lb.	lb.	.50	@
Asbestos.....	ton	19.00	@ 21.00
Asbestos.....	ton	15.00	@ 35.00
Asphaltum "G" Brilliant.....	lb.	.03 1/2	@
Barium sulphate, precipitated.....	lb.	.06 1/2	@ .07
Barytes, pure white.....	ton	30.00	@ 35.00
off color.....	ton	18.00	@ 25.00
Bassor.....	ton	160.00	@
Benzol, pure.....	gal.	.70	@ .80
Beta-Naphthol.....	lb.	1.35	@ 1.50
Black Hypo.....	lb.	.45	@ 1.00
Bone ash.....	lb.	.04	@ .08
Cadmium trisulphate (f. o. b. London).....	lb.	2.75	@
yellow.....	lb.	.27 1/2	@ .35
Canella gum.....	lb.	.07	@
Carbon, bisulphide (drums).....	lb.	.10	@ .20
black (cases).....	lb.	.10	@ .20
tetrachloride (drums).....	lb.	.08	@
Caustic soda, 76 per cent.....	lb.	.04 1/2	@ .05 1/4
Chalk, precipitated, extra light.....	lb.	.04 1/2	@ .05 1/4
precipitated, heavy.....	lb.	.04	@ .05
China clay, domestic.....	ton	10.00	@ 15.00
imported.....	ton	40.00	@ 50.00
Chrome, green.....	lb.	.35	@ .24
yellow.....	lb.	.35	@
Coal tar.....	hbl.	4.50	@
Coal oil, refined.....	hbl.	10.40	@
Cotton linters.....	lb.	.05 1/2	@
Gas black.....	lb.	.22	@ .25

Glycerine, C. P. (drums).....	lb.	37.50	@ .57
Graphite, flake (400 pound bbl.).....	lb.	.12	@
powdered (400 pound bbl.).....	lb.	.05	@
Green (oxide of chromium) (cases).....	lb.	.02 1/2	@
Green (oxide of iron) (cases).....	lb.	.02 1/2	@
Indian red, reduced grades.....	lb.	.03 1/2	@ .06
Industrial earth, powdered.....	ton	60.00	@
lotted.....	ton	65.00	@
Iron oxide, red, reduced grades.....	lb.	.03 1/2	@
red, pure, bright.....	lb.	.08 1/2	@ .09
Ivory black.....	lb.	.16	@ .30
Lampblack.....	lb.	.12	@ .18
Lead, red oxide.....	lb.	.08 1/2	@
sublimed blue.....	lb.	.08 1/2	@
white, basic carbonate.....	lb.	.08 1/2	@
white, basic sulphate.....	lb.	.01 1/2	@ .01 1/2
Lime, French.....	lb.	.09 1/2	@ .11 1/2
Litharge.....	lb.	.10	@ .11
English.....	lb.	.12	@ .13
Lithopone.....	lb.	.14	@
Imported.....	lb.	.19	@ .22
Magnesia, calcined.....	lb.	.40	@ .50
calined, heavy, Thistle Brand.....	lb.	.14	@
light.....	lb.	.45	@ .50
Magnetite, calcined, powdered.....	lb.	.03 1/2	@
Mica, powdered.....	ton	100.00	@
Mineral rubber.....	ton	36.50	@
"M. R.".....	ton	50.00	@
"M. R.".....	ton	50.00	@
"M. R.".....	ton	40.00	@
Naphtha, stove gasoline (steel bbls.).....	gal.	.24	@
56/68 degrees.....	gal.	.28	@
58/60 degrees.....	gal.	.29	@
V. M. & P.....	gal.	.23	@
Oil, aniline.....	lb.	.60	@ .70
linseed.....	gal.	.14 1/2	@ .15
palm.....	gal.	.17	@
paraffin.....	gal.	.17	@
pine (sublimed).....	gal.	.70	@
rapeseed.....	gal.	1.05	@ 1.15
rosin, heavy body.....	gal.	.30	@
tar (cases).....	ton	.20	@
schellie aniline colors, yellow, orange.....	lb.	.10	@ .75
blue, green.....	lb.	.12	@ .12 1/2
Orange mineral, domestic.....	lb.	.04	@ .04 1/2
Paragol (carloads).....	lb.	.04	@ .04 1/2
Petrolatum.....	lb.	.04	@ .04 1/2
Petroleum grease.....	lb.	.04	@ .04 1/2
Pine tar.....	hbl.	7.00	@
Pitch, burgundy.....	lb.	.03 1/2	@ .03 1/2
pure.....	lb.	3.50	@
Prussian blue.....	lb.	1.50	@ 1.70
Pumice stone, powdered (bbls.).....	lb.	.03	@
French.....	lb.	.18	@
Rosin, Pontianak.....	lb.	.15	@
granulated.....	lb.	.15	@
fused.....	lb.	.15	@
Resin (280 pound bbls.).....	hbl.	6.30	@ 7.50
Rotten stone, powdered.....	lb.	.02 1/2	@ .04
Rubber black.....	lb.	.04 1/2	@
Rubber substitute, black.....	lb.	.12 1/2	@ .12
white.....	lb.	.12 1/2	@ .12 1/2
brown.....	lb.	.13	@ .18
Rubblie.....	lb.	.30	@ .34
Shellac, fine orange.....	lb.	8.00	@ 15.00
Soapstone, powdered.....	lb.	.03 1/2	@ .09 1/2
Starch, corn, powdered.....	lb.	.215	@
Sulphur, chloride (drums).....	ton	8.00	@ 15.00
Sulphur, flour, velvet, Brooklyn brand (carloads).....	ton	5.00	@
Talc, American.....	ton	4.50	@ 4.75
Telool, pure.....	lb.	.02 1/2	@ .03 1/2
Triplite earth, powdered.....	lb.	.02 1/2	@ .03 1/2
Turpentine, pure gum spirits.....	gal.	.45	@ .45
wood.....	gal.	.43	@ .45
Venice.....	gal.	.50	@ .55
Ultramarine Blue.....	lb.	1.00	@ 1.25
Vermilion, brilliant.....	lb.	1.00	@ 1.25
Chinese.....	lb.	1.50	@ 1.60
English.....	lb.	1.50	@ 1.60
Wax, bayberry.....	lb.	.21	@ .23
beeswax, white.....	lb.	.50	@ .55
ceresin, white.....	lb.	.18	@ .20
carnauba.....	lb.	.60	@ .44
zokerite, green.....	lb.	.80	@ .90
montan.....	lb.	.30	@ .32
paraffin, refined, 118/120 m. p. (cases).....	lb.	.06 1/2	@
123/125 m. p. (cases).....	lb.	.07	@
128/130 m. p. (cases).....	lb.	.08	@
133/136 m. p. (cases).....	lb.	.09 1/2	@
crude, white, 117/119 m. p. (bbls.).....	lb.	.04	@ .04 1/2
yellow, 124/126 m. p. (bbls.).....	lb.	.05 1/2	@
Whiting, Alba.....	cut.	.55	@ .65
commercial.....	cut.	.75	@ 1.00
gilders.....	cut.	.85	@ 1.00
Paris, white, American.....	cut.	.90	@ 1.00
English chit-tone.....	cut.	1.50	@
Wood pulp XXX (carloads).....	ton	22.00	@
Yellow ochre (Satin).....	lb.	.02	@
Zinc oxide, American process, horseshoe.....	lb.	10.00	@
"Special".....	lb.	16.00	@
"XX red".....	lb.	16.00	@
French process, green seal, f. o. b. factory lb.	lb.	16.00	@
red seal, f. o. b. factory lb.	lb.	17.00	@ .26
white seal, f. o. b. factory lb.	lb.	15.00	@
Zinc sulphide, pure.....	lb.	15.00	@



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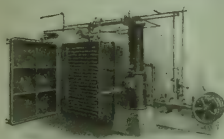
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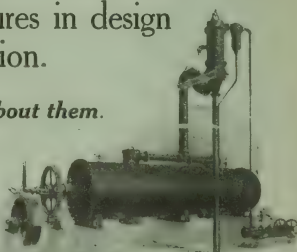
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PREPAREDNESS—LOOKING BACKWARD.

Extract from a letter written by _____ to a friend
in _____, August 1, 1920.

DEAR M ———:

Since my last, things have moved rapidly if not pleasantly for our country and for the rubber trade. The war, our first with a really first class power, has now been on for six months—a half year of disaster. Such preparedness as we had indulged, rendered ineffective by graft, incompetence and politics, availed us hardly at all. Our navy defeated, our soldiers on the defensive, we are in sore straits—yet the whole country is rallying for real defense in a manner that promises a final triumph no matter how long delayed.

Aside from the scarcity and consequent high price of crude rubber, the trade is doing well. The factories on the Atlantic Coast have established headquarters either in Cleveland or Chicago. Manufacturers in the Middle West have taken over the work of some Eastern mills, while others have simply closed their doors.

The arrival of a merchant submarine at New Orleans with a thousand tons of rubber cheered the manufacturers exceedingly. They gladly paid the price, \$5. a pound, and made the intrepid captain a substantial present besides. It is believed, by the way, that the present price is high water mark and that within a few months three-dollar rubber is a possibility. This belief is founded upon the supplies of guayule that are beginning to arrive. Several plants have also been erected in Colorado and are able to extract rubber profitably from the *Picradenia*, which is very abundant. Central rubbers have begun to come in, as Mexico, and the countries south of her, rising to the bait of high prices, are tapping everything that contains latex, and the aggregate is considerable. With the completion of the motor truck railway from Guatemala to Panama, and the linking up with the road from Colombia to Bolivia, South American rubber will come overland, provided, of course, we continue as in the past, to hold the Panama Canal.

It is splendid to note the cheerfulness with which all respond to the general call for economy in the use of rubber goods. The motor cars of the millionaires run on tires that long since failed to hold air and are filled with "tire fillers" and often covered with leather to hold core and carcass together. Rubber clothing has disappeared and slickers of a new, odorless type have taken its place. City buildings stripped of their rubber tiling and matting have added much to the vast quantity of scrap needed when the crude rubber supply was first shut off. Trench boots are the only goods turned out by the great footwear factories. Indeed, all of the rubber in the country is practically at the service of the government. It is most interesting to note the anger expressed toward our former agricultural department because they allowed us to be so long dependent upon foreign sources for our crude rubber. Experiments begun in the last few months show conclusively that there are several rubber producers that could be grown within our own borders. Not the kind that produce latex, but those of the guayule and grass rubber sort, that contain rubber itself.

It is said, also, that certain scientists are experimenting with the *Ekanda* root to see if by a process of selection a variety cannot be obtained that contains a larger amount of rubber milk. Could this percentage be increased enough, it might result in a great industry not unlike that of the sugar beet but with rubber, not sugar, the extracted product.

The only important compounding ingredient that the war has cut off is whiting, but there are so many earthy

fillers available that no especial hardship has been felt by its absence.

Of course, our export trade has been entirely destroyed. The few airships that venture forth cannot afford to carry freight, the mails alone taking all available room.

In the meantime the non-resistants are holding meetings and advocating the offer of a huge indemnity to the enemy to call the fight off. As if it were not disgrace enough for us to have been forced to pay the huge sums for the safety of New York, Philadelphia, and Washington, followed by the destruction of the latter city because a civilian wounded a soldier. No, the rubber trade are not for peace at present, but after this war is over, they and hosts of others are going to be strong for PREPAREDNESS. It is a bitter, costly lesson, but we had it coming, and believe me, it is one that will be thoroughly learned and long remembered. Sincerely,

X—

RUBBER PRICES WHEN PEACE IS RESTORED.

THE question of rubber prices, after the European war, is of interest, not only in producing, but more emphatically in consuming countries. Our British contemporary, the "India Rubber Journal," is of the opinion that there is a definite danger of violent price fluctuations once peace is declared. The war period has brought new influences to contend with, but there will be still another factor to be reckoned with, when peace is really in sight. Then speculators are likely to come forward under the unusual and almost certain demand. Austria and Germany will want 40,000 tons of raw rubber, or its equivalent in manufactured rubber goods, within a year of peace being declared, while the allied countries will be large buyers at the same time.

The Journal believes that therefore the demand on account of the enemy and other countries is likely to be formidable, and so insistent that prices may run wild; the rise in price may be checked by London and New York agents holding their hands for a little time until stocks have accumulated. If either side becomes too powerful we shall see prices which will be unreasonable, and which may affect not only spot sales, but forwards, for many years to come.

Further, our contemporary states that;

While commercial groups convene to discuss trade developments after the war it has heard of no steps being taken to check any irrational development during the peace phase referred to. Growers alone would never do anything which would in any way affect the law of supply and demand, and any action, to be successful, would have to secure cooperation of buyers' and sellers' agents, an almost impossible arrangement. This will be the most

vulnerable period and the possibilities are so great as to demand timely consideration. No one wishes Germany and Austria to get their rubber cheap, especially since the major part of the plantation supplies comes from British possessions. But, on the other hand, no one wishes home trade to be penalized by the activities of agents who will be out for produce so long denied by our navy.

While there is much theorizing regarding prices at that time, and later, it seems well worth considering that the Eastern plantations will raise this year, or next, that 40,000 tons extra needed by Germany and Austria, thus in no way interfering with the normal demands of the rest of the world, while, if this amount is not sufficient for the period under consideration, England can throw into the market some of the raw rubber she is now storing for the very purpose of preventing it from getting in the possession of nations fighting against her. It looks as if the whole question of preventing unwise speculation is quite largely in the hands of the British themselves, either in London or in the Far East.

THE EMPLOYERS' PATRIOTIC DUTY.

WHEN the orders came for the militia to proceed to the frontier, many thousand men answered the call of duty, leaving their stores, offices or workshops to serve their country. What is more, they left their homes and families, and probably, in many cases, they left their families but meagerly provided for, or totally without means of support during their absence.

These patriots are doing their duty to the country at a tremendous sacrifice. Are those who stay at home doing their duty? Are they also sacrificing? Many employers, in fact a large proportion of them, are carrying the absent soldiers on their payrolls. Thus they are enabling the soldiers to continue to support their families. Such a course cannot be universal, but the more general it becomes, the nearer will employers come to bearing their just burden, and doing their full share of sacrifice for the nation.

THE MOST SIGNIFICANT FEATURE OF THE RUBBER CLUB outing this year was not the attendance, the sports, nor the dinner. They were all of the biggest, the most enthusiastic, and the best. It was the special train that bore the guests from distant centers, and returned them speedily and comfortably when the day was done. It showed that the club was no longer local even as far as New York is concerned.

IT HAS LONG BEEN PREDICTED THAT MOTOR TRUCKS would in time outnumber pleasure cars. The new detachable flanges that adapt motor truck wheels to railroad tracks will be a potent factor in increasing the use of trucks. Possibly the flanged wheels for the rails will be rubber shod, in time giving rail speed equal or greater than road speed. At all events every truck, whether fitted for railroad use or not, is equipped with the regulation rubber tires and ever will be.

The Electric Storage Battery in the Motor Car.

IT is estimated that there are 28,000 electric vehicles in the United States, of which 20,000 are pleasure and 8,000 are commercial cars. The cost of the average battery to the manufacturer, for a pleasure car, is about \$300, and \$500 for a commercial car; so that \$4,000,000 is the sum expended for automobile batteries and \$6,000,000 for commercial car batteries. The average number of hard rubber jars in a pleasure car is

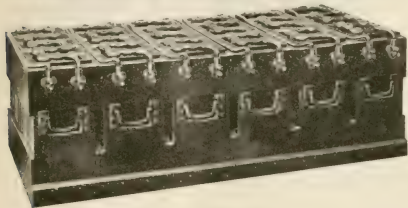


FIG. 1. WILLARD VEHICLE BATTERY.

32, and 44 for the commercial, or a total of 1,000,000 jars. The average cost is \$1.50 per jar to the manufacturer; which figures a total of \$1,500,000 for hard rubber jars.

There are about 1,500,000 starting and lighting batteries being used in the United States, costing the manufacturer an average of \$15 each or a total of \$22,500,000. There are three cells to the average battery, or 4,500,000 jars in use, which cost the manufacturer about \$1.00 each or a total of \$4,500,000 for hard rubber jars.

The above estimates do not include hard rubber covers, separators and vent plugs, which would materially increase the grand total of figures for hard rubber used in electric storage batteries.

This article will cover the storage battery only as applied to automobiles and commercial cars for driving, starting, lighting and ignition purposes. Such batteries are also used for house and railway car lighting, for lighting, power and ignition in motor boats. In radio apparatus they are indispensable, and recently the submarine has emphasized the importance of the storage battery and its hard rubber insulation in modern warfare.

The fundamental principle of the electric storage battery is best illustrated by the voltmeter, a well-known instrument in which water is decomposed by an electric current. The voltmeter consists of a glass jar containing two platinum plates covered with acidulated water and connected by wires to an electric battery. When an electric current is established, small bubbles of oxygen collect on the positive plate, or electrode, and of hydrogen on the negative electrode. If the battery current is cut off and the two electrodes connected to a galvanometer, a reverse current is registered. For storage battery purposes, however, the electrolysis of water was impractical, as the hydrogen and oxygen quickly escape.

Planté invented a cell in which two lead plates insulated by hard rubber strips were placed against each other and covered with sulphuric acid diluted with water. When electric current is passed through the electrodes the water or electrolyte is decomposed, the oxygen separating at the positive plate and the hydrogen at the negative. The positive plate becomes oxidized and covered with a coating of lead peroxide. When the battery current is cut off and the plates connected, a reverse current is established and the peroxide is reduced to lead, while the other plate becomes oxidized.

Fauré's improvements consisted in coating both plates with red oxide of lead paste, which contains a smaller proportion of

oxygen; thus the current only has to form peroxide on one plate and reduce the oxide on the other.

Many improvements have been made by modern inventors toward correcting the inherent defects of the original types. The most successful modern storage batteries depend on the same chemical reaction as in the original Planté cell, but with one notable exception—the Edison—which uses nickel-steel plates in an alkaline solution, with the advantage that the battery is much lighter, and also that the absence of the sulphuric electrolyte makes possible the use of a metallic jar.

Hard rubber has been found to be practically the only flexible insulator impervious to the action of sulphuric acid, which is the basic electrolyte in the lead storage battery. For that reason, hard rubber jars, separators, vent-plugs, hold-downs, and insulation tubes are used; also soft rubber gaskets, plugs and rubber-insulated battery terminals. Descriptions of a few of the well-known types of vehicle storage batteries will in a general way cover the entire field.

THE WILLARD BATTERY CELL.

One of the best-known is the "Elba." A 6-volt cell type "M-11" is shown in Fig. 2.



FIG. 2. ELBA CELL.—TYPE "M-11."

A—Hard Rubber Jar. B—Hard Rubber Perforated Separator. C—Hard Rubber Cover. D—Hard Rubber Hold-downs. E—Hard Rubber Vent-Plug. G—Soft Rubber Gasket. H—Positive Plate. I—Negative Plate. J—Wood Separator.

The individual cell principle is employed in all types; any one cell can be inspected or repaired without disturbing the others. The plates are the pasted type and the grid is made of an alloy consisting of lead and antimony. The jar, cover, hold-downs, vent and perforated separator are of hard rubber; the vent-plug and sealing gasket are of soft rubber. The separator might be compared to a piece of lace. It is honey-combed with holes and, therefore, allows the electrolyte to seep through evenly so that the battery gives maximum service at all times. The separator is ridged with rubber strips which protect it against wear by the abrasion caused by the vibration of the car.

The plates measure $5\frac{3}{4}$ by $8\frac{5}{8}$; there are 11 to each cell and the discharge is $27\frac{1}{2}$ amperes for 5 hours. The complete cell measures $3\frac{3}{4}$ by $6\frac{1}{8}$, by $13\frac{7}{8}$ inches high and weighs $30\frac{1}{2}$ pounds.

THE E. S. B. CELL.

The "Ironclad-Exide" cell, type "7-MV," is shown in Fig. 3. The positive plate is of novel construction. It has a grid composed of a number of parallel, vertical metal rods united integrally with the horizontal top and bottom frames. Each rod forms a core which is surrounded by a cylindrical pencil of peroxide of lead, the active material. This, in turn, is enclosed by a hard rubber tube having a large number of horizontal slits. These serve to provide access for the electrolyte or solution to the active material, and yet are so fine as to practically eliminate the washing out of the material. The outside tubes are reinforced by leaving the exposed edge solid, that is, without slits.

Each tube has two parallel, vertical ribs projecting on oppo-

site sides at right angles to the face of the plate and these not only serve to stiffen the tubes, but also act as insulating spacers. The rubber tubes have a certain amount of elasticity, allowing them to compensate for changes in volume of the active material, due to expansion and contraction during charge and discharge. The negative plate consists of gray spongy lead and the top and bottom edges are encased in rubber vulcanized in place. This eliminates the possibility of short circuits from

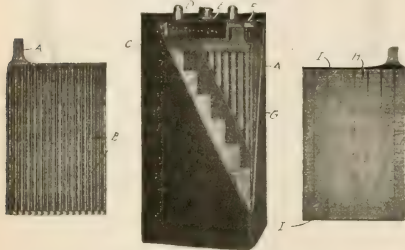


FIG. 3. "IRONCLAD-EXIDE" CELL-TYPE "7-MV."

A Positive Plate, *B* Hard Rubber Tubes, *C* Hard Rubber Jar, *D* Hard Rubber Vent, *E* Soft Rubber Plug, *F* Hard Rubber Cover, *G* Wood Separator, *H* Positive Plate, *I* Hard Rubber Insulator.

material bridging across from the positive frames. The negative frames are undercut so that the rubber sheathing is flush and does not project beyond the surface of the plate. There are 7 plates, which measure $5\frac{3}{4}$ by 8 $\frac{1}{2}$ inches, and the discharge in amperes for 4 $\frac{1}{2}$ hours is 21. The rubber jars are $2\frac{3}{4}$ by 6 $\frac{1}{2}$ by 12 $\frac{1}{2}$ inches high and weigh 22 $\frac{3}{4}$ pounds.

THE U. S. H. & L. BATTERY CELL

The positive plate of the U. S. L. type "WB," shown in Fig. 5, is made up of antimonious lead grids of the stagard bar type. A paste mixture of oxides forming the active material is forced into the cells of the grid under pressure, giving the finished plate a dark brown color.

The grid of the negative plate is made up of an antimonious center web with thickened edges to give it strength and rigidity.

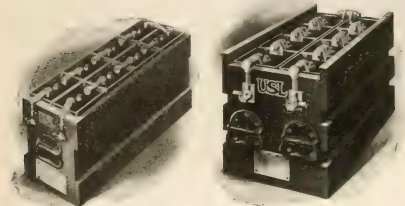


FIG. 4. THE U. S. H. & L. VEHICLE BATTERY

The active material is applied under pressure, resulting in a finished plate of a slate gray color.

The bridges in the hard rubber jar have soft rubber tops on which the plates rest. These act as shock-absorbing cushions. The size of the plates is $5\frac{3}{4}$ by 8 $\frac{1}{2}$ inches, and the 7-plate cell will discharge 21 amperes in 4 hours. The jars measure $2\frac{3}{4}$ by 6 $\frac{1}{2}$ by 13 $\frac{1}{2}$ inches high, and the cell complete weighs 22 $\frac{3}{4}$ pounds.

THE EDISON BATTERY CELL

The Edison type "A-4" cell consists of four positive, and four negative plates. (See Fig. 6.) The former are made of per-

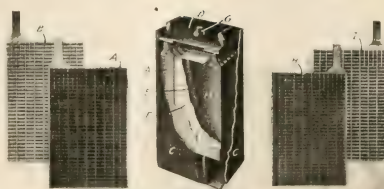


FIG. 5. U. S. H. & L. CELL-TYPE "WB-7."

A Positive Plate, *B* Positive Grid, *C* Hard Rubber Jar, *D* Hard Rubber Vent, *E* Hard Rubber Separator, *F* Wood Separator, *G* Hard + Soft Rubber Vents or Extensions, *H* Negative Plate, *I* Negative Grid.

forated nickel-plated steel tubes, filled with alternate layers of nickel hydrate and metallic nickel flake. The negative plate contains pockets of perforated steel, holding iron oxide, the negative active material. The four positives are supported on a horizontal rod, forming part of the pole or terminal. They are spaced apart by nicked steel washers, and clamped firmly by a nut on each end of the rod. The five negatives are similarly mounted on their pole. The two groups are then assembled. In order to support rigidly the edges of the plates, there are placed thereon two hard-rubber "ladders," each of which has grooves into which the plates fit. The compact mass is then ready for the can.

The hard-rubber "stool," or plate support, is then placed in the can bottom, and the grouped elements pushed in. Two

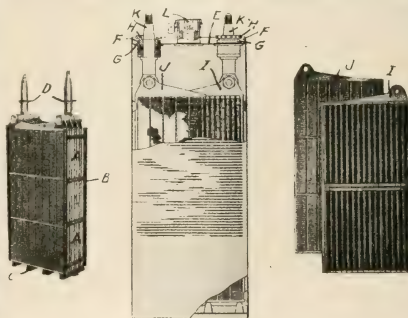


FIG. 6. EDISON CELL-TYPE "A-4."

A Hard Rubber Separator, *B* Hard Rubber "Ladders," *C* Hard Rubber Support, *D* Hard Rubber Washer, *E* Wood Separator, *F* Hard Rubber Bushing, *G* Soft Rubber Gasket, *H* Hard Rubber Gland, *I* Positive Plate, *J* Negative Plate, *K* Poles, *L* Filling Aperture, *M* Positive Plate, *N* Negative Plate.

thin sheets of hard rubber are next placed between the outside negatives and the can ends, and after a hard-rubber washer is slipped over each pole, the top is placed in position and welded on.

A hard rubber bushing is next placed over the poles to insulate them from the can top. Into the little well around each pole is placed a pure gum gasket, followed by a metal ring. The hard-rubber threaded glands are forced home, resulting in the compression and expansion of the gasket, with consequent sealing around the poles. Mounted on the top between the two terminals is the gas vent and filling aperture combined.

The electrolyte is then put into the cell. This is composed

of 21 per cent solution of chemically pure potassium hydrate and distilled water, to which is added a small amount of lithium hydrate.

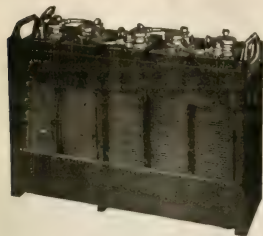


Fig. 7. The Edison Vehicle Battery.

STARTING, LIGHTING AND IGNITION BATTERIES.

The batteries used in connection with electric starting systems are selected for their ability to crank the engine at sufficient speed, and for a sufficient length of time, to insure positive starting, especially when the engine and mechanism is stiff, due to cold weather or maladjustment.

The rates of discharge are high, yet the starting battery must occupy little space and be of minimum weight. It must withstand shocks, jolts, short circuits, charges at 16 times above normal rates, and discharges at 25 times above the normal or ideal rate.

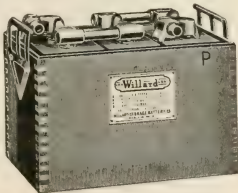


Fig. 8. The Willard Starting Battery.

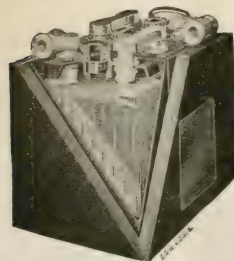


Fig. 9. The "Exide" Starting Battery.

For lighting purposes a high capacity battery is necessary, owing to the greater amount of current needed. Ampere discharge rate plus capacity in hours is the only true indication of battery value. The lower the discharge rate in amperes the greater the capacity in hours obtained. Lighting batteries may also be used for ignition and operating electric

A tire filler that has been recently exploited in Chicago by mysteriously withholding the name and sponsors of the compound is now announced as "Tireoid." It is manufactured by the Tireoid Co., 1200 Michigan avenue, Chicago, Illinois. W. L. Rohrer, of Chicago, is president, and among other prominent men connected with the company are A. Watson Armour, Martin J. Insull, Lafayette Markle and James Levy. The compound was invented and patented by R. T. Garvin.

The National Rubber Co., Elgin, Illinois, has recently increased its capital stock from \$10,000 to \$60,000.

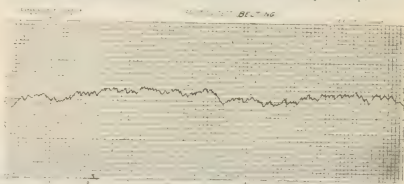
AUTOGRAPHIC FRICTION TEST OF HOSE AND BELTING.

THE methods and resultant autographic charts of hose and belting friction tests made on the autographic testing machine that was illustrated and described in THE

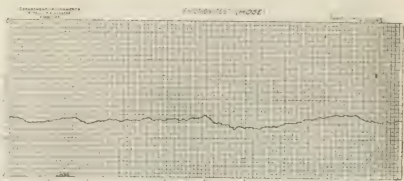
INDIA RUBBER WORLD, May 1, 1916, are shown in the accompanying illustrations through courtesy of the Bureau of Standards, Washington, D. C.

The views show only the upper details of the machine as it appears when making the tests. The one on the left is seen with the hose sample in place and the autographic pen recording the friction or adhesion between the plies at all points of the strip being tested. The sample consists of a round section of hose one inch wide, and is fitted over a mandrel that revolves in a fork suspended from the top of the machine, the detached end of the fabric being secured to the lower grip.

On the right the machine is shown while making a rubber belting test and recording the variations of the friction curves at the same time. The test piece consists of a one-inch strip containing two plies that are separated for a short distance to afford space for attaching the grips. One end is attached to the upper and the other to the lower grip, and as the plies are pulled apart by the machine the autographic attachment records the adhesiveness at all points of the sample strip.



RECORD OF BELTING TEST.



RECORD OF HOSE TEST.

The charts shown above are exact reproductions of the records made of the above tests at the Bureau of Standards. The figures on the left margin of the charts represent the tension in pounds.

The variation at any point on the strip being tested is readily seen by referring to figures at the bottom of the charts. These figures represent the length of the strip tested, in inches.

Rubber Club of America Outing.

MEMBERS of the Rubber Club of America, Inc., were in a state of preparedness for at least 60 days prior to July 18—preparedness for the outing of the club scheduled for that date. Reports were rife that every wielder of a golf club was working every Saturday as well as every spare evening as long as it was light enough to see a golf ball, and it is intimated that some of them painted these balls with phosphorescent material in order to prolong their practice. It was the same way with tennis players, swimmers and quoit pitchers. All were practicing in order to capture some of the handsome prizes the club was sure to offer in the contests.

The time, as stated above, was July 18, all day and part of the night. The place, Vesper Country Club, Tyng's Island, on the Merrimac River, near Lowell, Massachusetts. It is doubtful if a more suitable place could be found in any one of a dozen states. Those who attended the outing there last year knew

eral sales manager of the B. F. Goodrich Co., and Secretary C. B. Raymond of the same company.

The Firestone Tire & Rubber Co. was also represented by R. J. Firestone, S. G. Carkhuff, J. W. Thomas, R. E. Glass, H. W. Kugler, C. A. Myers, H. J. Adams, E. C. Knox, H. W. Smith, and last, but by no means least, E. S. Babcox, the advertising manager.

Besides Messrs. Rutherford and Raymond, the Goodrich



AT NOON TIME MEMBERS WERE BUSY DISCUSSING THE EXCELLENT LUNCH PROVIDED.



OFFICERS AND PAST PRESIDENTS PRESENT:

Standing:—Secretary Vorhies, Past President Pearson, Director Bruyn Past President Hood. Sitting:—Vice-President Cartmell, Past President Hodgman, President Firestone, Director Litchfield.

this, and those who came this year for the first time agree unanimously with the others.

company's force was represented by E. C. Tibbetts, the advertising manager, W. H. Yule, W. C. Geer, H. E. Kelly and H. M. Bacon.

The Goodyear Tire & Rubber Co. had as its quota, Vice-president P. W. Litchfield, W. D. Shilts, M. E. Morris, E. S. Stevens and R. H. Daniels.

Others of the party included President Thomas F. Walsh, of the Swinehart Rubber Co.; President H. W. Dupuy, of the Pennsylvania Rubber Co.; E. C. McGraw, of the McGraw Tire & Rubber Co.; Treasurer C. W. McLaughlin, of the Mohawk Rubber Co.; Vice-president J. H. Kelly, of the Republic Rub-



MEMBERS AND GUESTS OF THE RUBBER CLUB OF AMERICA, INC., AT THE

And there were many new-comers this time. For instance, two special Pullman cars started from Akron, Ohio, on Sunday night with nearly 40 rubber men, in charge of H. S. Firestone, president of the Rubber Club; W. O. Rutherford, gen-

ber Co.; Frank Lahey, Harold French, William McArthur, Jack Handy, Sydney D. Gridley, Leroy Wood, W. H. Bass, A. R. White and Harry Henderson. This big delegation arrived in Boston, Monday noon, where they were met by representatives

of the Eastern manufacturers, and after a lunch at the Copley Plaza, were taken in automobiles to various points of interest on the North Shore, and to dinner at the Masconomo House at Manchester, Massachusetts, returning late in the evening.

Monday night a train of five sleepers and a buffet car left New York City with about 80 rubber men from that city and nearby manufacturing centers, which ran direct to Lowell and debarked the passengers at the land end of the famous vibrating suspension bridge leading to the grounds.

The Boston contingent, between 100 and 200 strong, and the Lynn Cadet Band came in another special train to the same spot. Besides these who arrived by rail, there were automobiles aplenty. Massachusetts cars, of course, were in the majority.



TEAM WORK DRIVE. YOUNG, A LONG DRIVE, AND JONES, A STRAIGHT DRIVE, IN COMBINATION DRIVE. RESULT, A LONG STRAIGHT BALL.

but there were Mr. Darrach's and another car from Connecticut, Mr. Milligan's from New Hampshire, Mr. Murray's from New Jersey, Mr. Firestone's from Ohio, and Mr. Berkenstein's from Illinois.

The new-comers, or perhaps we should say, those who attended for the first time, certainly had no cause for complaint at their cordial reception. Old acquaintances or new, it was a hearty welcome of good fellowship. No one stood on ceremony. There was the usual sorting out into bunches of congenial members, and those who did not care to enter into the strenuousness

players. There were so many entering some of the contests that it took the main part of the day to choose the winners by the process of elimination. As a guess, there were probably 50 entrants in the quoit contest, which finally narrowed down to two, F. Feinburg securing the first prize, a fine chafing



THE WATER SPORTS INTERESTED MANY PARTICIPANTS, AND A HOST OF SPECTATORS.

dish, and A. R. White capturing the second prize, an electric lamp.

The clock golf contest was to start at noon, but as lunch was announced at the same hour, the game was postponed until after this feature of the program. Seated around tables under the shadow of great trees, the members were served edibles and drinkables to their heart's—or their stomach's—content. Meanwhile the band played—in fact the band played pretty continuously all day and evening, sometimes with a volunteer leader to whom, in his good nature, Leader Lurvey temporarily surrendered his baton.

The clock golf interested 37 contestants and as many spectators as could be accommodated around the rim of the field. H. S. Firestone scored best. His score was 21. There were four whose score was 23 and who were therefore pronounced the "Skidoo Club." The contest finally narrowed down to P. E. Young and R. L. Chipman, who tied at 18. Chipman said Young was taking too many prizes, so he beat him 21 to 22, and won a pair of beautiful silver mounted hair brushes.

In the golf tournament, W. S. Carleton held the best gross



SEVENTEENTH ANNUAL OUTING AT LOWELL, MASSACHUSETTS, JULY 18, 1916.

of the sports, found enjoyment in quieter ways on the clubhouse veranda.

The elaborate series of tennis courts were occupied practically all day. The golf course, a splendid one, was never free from

score, 83. E. C. Clark and F. H. Jones were tied for best net, Clark's score being 84, handicap 8, net 76, and Jones scoring 91, handicap 15, net 76.

Harry Tyer had charge of the ball game. In order to get it

Rubber Cements in Leather Goods Manufacture.

ONE of the most valuable uses of rubber, and also a most wide-spread one, is as an adhesive. As such, it is a necessity in many trades. Rubber cements are many and varied, differing in properties and qualities according to the requirements of the various uses.

In manufactures of leather, good rubber cements are especially valuable. While many leather articles are made by stitching the different parts together, others, particularly those of lighter leather, are fastened wholly by cementing, or by cementing and then reinforcing by stitching. Rubber cements figure in many trades. Bag and pocket-book makers, hatters, box makers and shoe manufacturers use large quantities. These cements are used today for purposes which years ago were undreamed of. Some of them have a tenacity sufficient to be used in processes where formerly tacks were employed. This is the case with sole-laying cement, used in shoemaking, to hold the sole in place to the lasted upper, preliminary to stitching.

And in many other processes of shoe manufacture cements are used, their composition varying to adapt them to the special work they are required to perform.

In trade parlance, cements made of gutta percha are included under the generic name of rubber cements, though the purist might pronounce such a misnomer. As a rule, cements are mainly solutions of gums in naphtha. There are other solvents: chloroform, ether, bisulphide of carbon are efficient for this purpose, but are too expensive for general use. For some degrees of tenacity gum mastic, gumlac, or ordinary rosin is added. Such cements require heating and softening to apply, but these ingredients add brittleness, a quality which unifies cements containing them for joining where suppleness is required.

SOLE-LAYING CEMENT.

To make a cement for sole laying, the following formula is recommended: Lagos buttons or strips, 10 pounds; Pontianak, 5 pounds; naphtha, 20 gallons. This is also used as an oil proof

CHANNEL CEMENTS.

Channel cements are used to close the lip of leather which has been raised to allow the sole to be stitched to the welt, the object being to cover the stitches and give a smooth, unbroken finish. For such cement various formulas are presented. For these, the rubber used is washed but not sheeted. Three of these are similar, but the quantity of rubber varies. Each contains 5 pounds of rosin and 40 gallons of naphtha, but one calls for 10 pounds, the second for 20 pounds and the third for 30 pounds of Para rubber.

A fourth channel cement calls for 10 pounds of Madagascar pinky, 40 ounces of rosin and 20 gallons of naphtha.

Number 5 requires 12 pounds of Madagascar rubber, 12 pounds of Madagascar niggers, 8 pounds of rosin, 2 pounds of common pitch and 50 gallons of naphtha.

Another channel cement receipt is 6 pounds of fine Para rubber, 4 pounds of hard African rubber, 16 gallons of naphtha, and of rosin 3 pounds in the summer or 2 pounds in winter.

COLORED CEMENTS.

If colored cements are desired, most formulas are practically the same as the first three channel cements mentioned above, with aniline dyes in proper proportions. For instance, a batch of 40 gallons, to be colored black would require $\frac{1}{2}$ ounce of black aniline. For red cement, $\frac{1}{2}$ ounce of red aniline is needed to each 40 gallons. Blue cement would require 2 ounces of blue aniline. Green cement should have 2 ounces of green aniline. Yellow cement needs 3 ounces of yellow aniline to acquire the proper color. Another black cement is made of Para rubber,

20 pounds; rosin, 5 pounds; bone black, 5 ounces; and naphtha, 40 gallons.

WELTING CEMENT.

For wetting cement 10 pounds fine Para rubber (sheeted) and 5 ounces of sulphur, are mixed and dissolved in 10 gallons of naphtha. A somewhat similar paste cement is 10 pounds of Majunga rubber (sheeted) and 20 gallons of naphtha. Where it is necessary that the cement shall not stain, as in cementing shoes of white leather to canvas, a paste cement is made of East Indian pale crepe, 20 pounds, to 50 gallons of naphtha.

FOR SHOE REPAIR.

Shoe repairers use cements to patch leather shoes. By skiving the patch down to a thin edge, and cementing, a much neater job is done than in the now almost obsolete way of stitching the patch on. For such purpose either one of the channel cements or wetting cements mentioned above are suitable.

RUBBER HEEL CEMENTING.

For attaching rubber heels and soles a special cement is recommended, which is made as follows: gutta percha (finely cut), 20 parts; ammonium sulphide, 18 parts; benzol, 3 parts; and turpentine, 24 parts. This combination is dissolved by shaking in a container at a slightly warm temperature, after which 35 parts of finely powdered asphalt are added, and the closed container thoroughly shaken for several days. This cement, which has a syrupy consistency, is warmed by immersion of the container in boiling water, and applied to the leather surface, properly prepared for it; then the sole or heel is laid on and subjected to a heavy pressure. A second cement for this purpose, which dries more quickly than the above, is made in two solutions, equal parts of each being mixed together at the time of applying. One solution contains 20 parts of finely cut gutta percha and 80 parts of ammonium sulphide. The second solution is 20 parts of shellac, 2 parts of crude turpentine, and 70 parts of alcohol.

PRECAUTIONS NECESSARY.

Leather and rubber surfaces, to which rubber cements are to be applied, need special preparation to secure successful adhesion. Both should be roughened,—the leather, to produce a fibrous surface for the penetration of the cement; and the rubber, for the removal of any incrustation of sulphur or talc. If the leather is at all oily a washing of the buffed surface with benzol is recommended.

For use on leather which contains oil, a cement is manufactured which contains a percentage of talc, powdered soap-stone, whiting, or some similar substance. This absorbs the oil, and allows the cement to perform its function. These substances do not dissolve, but are held in suspension in the cement, which must be thoroughly agitated before applying. Such cement is particularly useful in turning in the skived edges of shoe uppers, to produce a smooth finish.

PATCHING RUBBER SHOES.

Shoe repairers are often called upon to patch rubber footwear. A cement made for this purpose is made of Para rubber, 20 pounds; rosin, 8 pounds, and turpentine, 80 pounds.

RUBBER BLACKINGS.

Two receipts for rubber blacking may be appropriately given in this connection. A rubber blacking formula recommended is: caoutchouc oil, 12 pounds; acetic acid, 12 pounds; vinegar, 12 pounds; molasses, 20 pounds; and lamp black, 44 pounds.

A liquid blacking contains caoutchouc oil, 4½ pounds; sulphuric acid, 12½ pounds; vinegar, 27 pounds; gum arabic solution, ½ pound; molasses, 23½ pounds; bone black, 32 pounds.

What the Rubber Chemists Are Doing.

VULCANIZING BY ULTRA-VIOLET RAYS.

A FRENCH chemist, H. Olivier, has perfected the following method for vulcanizing rubber solutions by ultra-violet rays. The rubber solution, containing free sulphur, with or without certain organic or inorganic sulphides which are decomposed by ultra-violet rays, such as carbon bisulphide, allyl sulphide, or antimony sulphide, passes from a hopper on to an endless steel band, which is carried by guide rollers round the greater part of the periphery of a mercury vapor lamp. The lamp is surrounded by a double, hemicylindrical water-jacket of quartz, in order to cut off heat rays. The time of exposure is quite short, in order to avoid the deleterious effect of prolonged exposure to ultra-violet radiation on the rubber. As an example, a layer of solution a fraction of a millimeter thick, at a distance of 5 centimeters from the lamp, which is operated at 220 volts and 3 amperes, requires an exposure of about 40 seconds. After passing the lamp the solution is removed from the endless band to a receiving vessel by means of a scraper.

AGING TESTS.

C. Beadle and H. P. Stevens have tested the keeping quality of vulcanized material, from rubber prepared after the manner proposed by B. J. Eaton of the Department of Agriculture of the Federated Malay States, who suggested the treatment of rubber coagulum with caustic soda, sodium carbonate, or lime, to obtain a product having a very rapid rate of cure. The result of the test made by Beadle and Stevens shows that such rubber when vulcanized deteriorates on keeping, and sooner or later "perishes."

A series of experiments, conducted by C. D. Kratz, on accelerating vulcanization by increasing the temperature, leads to the conclusion that if a compound is correctly vulcanized the temperature at which it is vulcanized in no way affects its aging properties, and the author decides that it is therefore safe to increase the temperature of vulcanization (within reasonable limits) for the purpose of increasing output, provided that the highest temperature which may be employed corresponds with the shortest time capable of definite measurement under the conditions of vulcanization.

PLASTIC SUBSTANCES.

The war has necessitated the economy of such volatile solvents as ethyl alcohol and ether for use in the manufacture of explosives. In 1914 Henri Barthelemy, of Paris, published a study of this subject (See *THE INDIA RUBBER WORLD*, March, 1915, page 324). In a recent issue of "Le Caoutchouc & la Gutta Percha" he reverts to the subject from a mathematical point of view. He finds it practicable to recover at least 50 per cent of these solvents from the air containing them. Two systems are available for the purpose. One of these is the Claude process, which depends on heat absorption by expansion of the air in molecular contact with the solvents. The other is the ordinary system of refrigeration by machines using ammonia or carbonic and sulphuric anhydrides.

Each method has advantages and disadvantages. The Claude is simple and economical of space, with low freezing efficiency, while the other system is more complicated, occupies more space, but is more effective.

The well-known French rubber chemist, André Duboscq, has recently discovered a new process for separating pure rubber from combined sulphur in reclaimings. He is said to be now perfecting the industrial application of this discovery.

METHODS OF ANALYSIS.

BARIUM CARBONATE IN VULCANIZED RUBBER.

THE method of J. B. Tuttle for the determination of barium carbonate in vulcanized rubber is as follows: One gram of the rubber is placed in a porcelain boat and ignited in a current of carbon dioxide in a glass tube. The residue is finely ground, treated with 5 to 10 grams of ammonium carbonate, 15 to 20 cc. of strong ammonia, and 50 cc. of water, and boiled for 15 to 20 minutes, to convert lead sulphate into carbonate. The insoluble matter (barium sulphate and carbonates of lead, barium, calcium and zinc) is filtered off, washed to remove soluble sulphates, and treated with 10 cc. of glacial acetic acid and sufficient water to make the total volume 100 cc. The solution is heated to boiling and filtered. Lead is removed from the solution by precipitation as sulphide, and the barium then determined as sulphate. This gives the barium present as carbonate, and the barium present in the rubber as sulphate is obtained by the difference.

CHEMICAL TREATMENT OF RUBBER.

THE UNITED STATES.

PRODUCING SUBSTANCES RESEMBLING CAOUTCHOUC. The process consists in polymerizing isoprene in the presence of from 2 to 5 per cent of isoprene ozonide. [Henry S. A. Holt and Gerhard Steinnig, assignors to Badische Anilin & Soda Fabrik, Ludwigshafen, Germany. United States patent No. 1,189,110.]

PROCESS OF RECLAIMING RUBBER. The waste rubber is heat-treated with protein in the form of an albumin. [Harold B. Murdock, Assignor to Rubber Regenerating Co., both of Naugatuck, Connecticut. United States patent No. 1,189,282.]

RECLAIMING RUBBER WASTE. The process of reclaiming rubber waste containing lead and sulphur by adding a reactive substance such as zinc sulphate, to form, with the sulphur and lead respectively, a light colored water-insoluble sulphide and a light colored water-insoluble lead salt, and converting the lead sulphide into the said light colored sulphide, and lead salt, through the action of the reactive substance (zinc sulphate). [Harold E. Murdock, assignor to Rubber Regenerating Co.—both of Naugatuck, Connecticut. United States patent No. 1,189,721.]

THE UNITED KINGDOM.

PROCESS AND APPARATUS FOR COAGULATING LATEX. Latex is supplied to tubes provided with longitudinal slots, arranged at top of a chamber into which a coagulating vapor or gas, such as carbon dioxide or smoke, is admitted. The latex flows from the slots on to a series of inclined glass or other plates, arranged vertically one below the other, in such a way that the uncoagulated latex from the top plate is received by the second plate of the series, and so on. The plates are in parallel pairs, pivoted about a horizontal shaft, so that when a layer of sufficient thickness has been formed on the upper plate of a pair, the pair can be rotated through 180 degrees to enable the under plate to receive the latex. By this method it is possible to separate the rubber from a given latex into different grades or qualities. [W. G. ten Honte de Lange, Jr., Bandoery, Java, and C. Bosman, Haarlem, Holland. British Patent No. 10,382 (1915).]

THE FRENCH REPUBLIC.

PROCESS AND APPARATUS FOR TREATMENT OF LATEX. Latex is placed in shallow aluminum trays (about 50 by 20 centimeters) to a depth not exceeding 2 centimeters, and the trays are packed on shelves in a chamber. A charge consists of

350 trays. Smoke, previously cooled, is passed through the chamber from a smoke generator for about 20 minutes, after which communication between the chamber and the chimney is closed, and the passage of the smoke into the chamber continued for about an hour and a half. The progress of the coagulation is observed through a glass window, and the chamber is kept closed for half an hour after the coagulum has shrunk away from the sides of the trays. The smoke is then allowed to escape, the chamber opened, the trays are allowed to stand for two hours, and the serum is poured off. The coagulum is transferred to a large tank of water, in which it is left over night, the sheets of rubber are washed with changes of water, and each sheet is then exposed to sunlight for one to two hours, after which it is lightly pressed in an iron or wooden mold and allowed to dry in the air for five or six days. [F. Ripeau. French patent No. 477,238, June 5 (1914).]

APPARATUS FOR VULCANIZATION BY ULTRA-VIOLET RAYS. See note preceding. [H. Olivier. French patent No. 477,204 (June 3, 1914).]

OTHER CHEMICAL PATENTS.

THE UNITED STATES.

- 1,189,548. Binding and coating composition. Carleton Ellis, Montclair, N. J., assignor to Ellis-Foster Co.
 1,189,550. Coating composition. Carleton Ellis, Montclair, N. J., assignor to Ellis-Foster Co.
 1,187,849. Method of making plastic compositions. Konstantin Tarassoff, Moscow, Russia.

UNITED KINGDOM.

- 1,469 (1916). Rubber substitute. G. M. Boddy, 8 Leadenhall street, London, England.

LABORATORY APPARATUS.

HYDROGEN SULPHIDE GENERATOR FOR INDIVIDUAL USE.

WHEN small amounts of hydrogen sulphide are desired the generator shown in the illustration will be found very convenient. As described by H. A. Noyes, the apparatus is essentially two ordinary test tubes, one of which just slips inside the other. Blow a small hole in the bottom of the smaller tube, insert a stick of ferrous sulphide, close the open end with a one-holed rubber stopper that has been fitted with a delivery tube.

To use: Fill the larger tube about one-third full of dilute acid and slip the smaller tube down into the acid. Gas is generated and conducted directly to the solution to be tested. When through using, the inner tube is quickly raised, stopper removed and the delivery tube and test tube washed out under the tap. This serves as a very satisfactory apparatus for individual use for the generation of small amounts of hydrogen sulphide. It is extremely simple and can be kept "ever ready" in the test tube rack.



A CRUCIBLE "FORK."

This little device, credited to H. G. Parker, of William Jewell College, Liberty, Missouri, has proved very practical and convenient. It was designed for the use of students, but may appeal to chemists in general. The fork is made of stout aluminum wire. The prongs of the fork enclose slightly more than a semi-circle and should be bent to fit the crucible used. The space between the ends of the prongs should be large enough to pass around the crucible when supported on a tripod, but small enough to prevent the crucible from slipping out when the fork is lifted. When properly adjusted the crucible is held very securely.



A HIGH TEMPERATURE BURNER.

The Scimatco laboratory burner illustrated below produces a short, wide flame that is uniformly hot, and the coolest part of it is hotter than the hottest part of a Bunsen flame. The

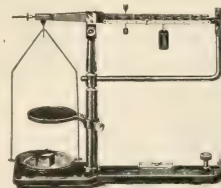


extremely high temperature of the flame of this burner is due to perfect mixture, maximum speed and the preventing of back-firing by the special design of the burner. The latter feature consists in the use of a grid of pure nickel $\frac{3}{8}$ inch thick, placed at the top of the tube.

For many purposes the burner replaces the blast lamp, with a saving of 48 per cent in gas and the elimination of expense, and noise of the blast. The non-reducing flame of the Scimatco burner is particularly suited for heating platinum ware, as it prolongs the life of the metal tenfold over that possible with the ordinary blast burner. [Scientific Materials Co., Pittsburgh, Pennsylvania.]

SPECIFIC GRAVITY BALANCE.

The illustration shows a very conveniently arranged triple-beam balance for general chemical use, and for taking specific gravities. Weighings are obtained by movement of the riders

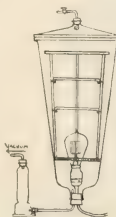


along the beams. These riders are easily handled and quickly placed in notches, but cannot be removed from the beams. An adjustable support is provided for holding a vessel of water in the case of specific gravity weighings. The three beams are placed in the same horizontal plane. Capacity of the middle beam is 100 grams by 10 gram divisions; back beam, 10 grams by 1 gram divisions; front beam, 100 centigrams by 1 centigram divisions. Total capacity, 111 grams; sensibility, 1 centigram. [Voland & Sons, New Rochelle, New York.]

VACUUM DESICCATOR.

The "home-made" vacuum desiccator devised by Dr. Percy A. Houseman, shown in the illustration, has proved very practical in drying materials *in vacuo* above room temperature. The apparatus is made from a percolator fitted with a desiccator lid.

The temperature at which the sample is dried may be regulated by varying the height above the electric bulb of the glass triangles attached to the tripod.



Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

LABORATORY APPARATUS PATENT.

UNITED STATES.

- 1,190,685. Viscosity testing apparatus. Hans F. Bauer, Cedar Rapids, Iowa.

SELECT METHODS OF ANALYSIS OF GOLDEN SULPHIDE OF ANTIMONY.

GOLDEN sulphide of antimony, or antimony pentasulphide, is a product of prime importance for the vulcanization of many rubber articles, notably for automobile inner tubes and surgical sundries.

The preparation of antimony pentasulphide is very delicate and if the different phases are not conducted with every required precaution, there is risk that a product will be obtained which will possess none of the qualities required in rubber manufacture. Pure pentasulphide of antimony is both an orange red pigment and a vulcanizing agent. It is capable, at the ordinary temperatures of vulcanization, of partially decomposing, with the liberation of 2 molecules of sulphur, becoming reduced to the red or trisulphide of antimony.

According to the method of its preparation, it is capable of carrying more or less free sulphur, besides antimonious acid, antimonates, red trisulphide, oxysulphides of antimony and of sulphate of lime.

Besides these substances, which are legitimate impurities of manufacture, there may be found flowers of sulphur, added mechanically, vermilion or red sulphide of mercury and oxide of iron added to produce a tone.

Before using it one should submit it to a thorough analysis to determine its exact contents of free sulphur and actual pentasulphide.

True golden sulphide should contain only antimony and sulphur. It should be neutral or slightly alkaline. If it is acid, its color deepens, loses its clearness and becomes maroon. This defect of acidity is one by which one is able to detect hurried manufacture and insufficient or hasty washing.

It should be very nearly impalpable and perfectly dry, a condition difficult to attain, except by vacuum drying process, because the drying temperature must not exceed 70 degrees C.

Various methods have been proposed for the analysis of golden sulphide, and some of them readily furnish knowledge of the commercial products on the market.

They are summarized below:

FREE SULPHUR

To use intelligently a golden sulphide, it is always necessary to know its free sulphur.

Herbst's Method.—A known weight of pentasulphide is extracted in a Soxhlet by freshly distilled sulphide of carbon for 8 or 10 hours. The sulphur solution is transferred to a tared beaker, evaporated on a water-bath and sulphur weighed after drying in an oven at 100 degrees C.

Weber's Method.—Ammonia dissolves the pentasulphide of antimony at a moderate temperature. Antimony oxide and free sulphur are insoluble.

A quantity of golden sulphide is dissolved in concentrated ammonia, gently heated on a water-bath, thrown on a tared filter and the residue washed with ammonia until the filtrate will no longer precipitate pentasulphide by acidifying.

The insoluble residue is dried at 60 degrees C., and extracted for 6 hours with freshly distilled sulphide of carbon.

The residue on the filter is practically antimonious acid which can be dried and weighed.

The bisulphide of carbon used for the extraction is evaporated on a water-bath, the residue is dried at 60 degrees C., and the sulphur weighed.

This method is long, but if the pentasulphide dissolved in ammonia is reprecipitated by acid, filtered and dried, one is able to determine by the same analysis the free sulphur, pentasulphide and antimonious acid.

COMBINED SULPHUR

Caspari's Method.—The analysis is made on a half gram sample from which the free sulphur has been removed by carbon

bisulphide. The extracted antimony sulphide is added gradually into 5 cc. pure nitric acid in an Erlenmeyer flask and the mixture cooled by immersion in water. The antimony is thus completely oxidized, but a certain quantity of the sulphur remains in the form of yellow masses. The flask is then slowly heated by immersion in boiling water, care being taken to guard against the fusion of sulphur. From time to time a pinch of potassium chlorate is added, until all the sulphur has disappeared.

The mixture is then transferred to a dish and evaporated to dryness.

The residue is taken up in 400 cc. of boiling water, with addition of a little tartaric acid, to keep the antimony in solution. The sulphuric acid formed is determined, in the usual way, as barium sulphate.

ANTIMONY.

Caspari's Method.—The determination of antimony should be conducted on a sample from which the free sulphur has been extracted, because it otherwise prevents the solution of the antimony sulphide in the acids. One-half gram of sulphur-free pentasulphide is dissolved in 10 cc. of hydrochloric acid and the sulphureted hydrogen expelled by boiling; 225 grams of tartaric acid and 200 cc. of water are added and the whole boiled. Any residue of silica should be filtered from the solution on a tared filter, dried and weighed. The antimony tartrate in the filtrate is precipitated as antimony sulphide by a current of hydrogen sulphide. The antimony sulphide is transferred to a large porcelain crucible and 3 cc. nitric acid is added to it. The crucible must be covered to prevent loss.

When the action is over, the mass is evaporated until dry, by immersion of the crucible in boiling water; then a few drops of nitric acid are added to the residue and the crucible is heated, first, slowly, over a small flame, then more powerfully, to expel the sulphur and the acid, and, lastly, calcination is effected. The antimony present is weighed as Sb_2O_3 and calculated as pentasulphide.

WATER.

Moisture is determined by drying 10 grams of pentasulphide either in a vacuum oven or in an ordinary oven in a current of nitrogen at a temperature not exceeding 60 degrees C. The percentage of moisture present should not exceed one per cent.

VERMILION.

The pentasulphide is totally soluble in ammonium sulphide without the application of heat, while vermilion is not soluble. In this manner these two substances can be separated.

After washing, the vermilion precipitate is dried and weighed.

If a commercial golden sulphuret contains pentasulphide, red trisulphide and vermilion, an aliquot part is first treated by cold ammonium carbonate which dissolves the trisulphide and leaves the pentasulphide and the vermilion. Then the residue is treated with cold ammonium sulphide which dissolves the pentasulphide and leaves the vermilion.

RUBBER COMPOUND TO REPLACE SEALING WAX.

A patent has been recently granted for a material that is flexible, adhesive and an excellent substitute for common sealing wax. It is composed of the following ingredients:

	Grams
Resin (colophony)	350
Pure rubber	300
Naphtha	100
Sulphur	100
White lead (dry)	200

For coloring, 40 grams of vermilion are added. The resin is first dissolved in a copper vessel and the other ingredients then added and the whole well stirred over a hot fire. The melted mixture is then poured into molds and when cool, the cakes are removed and allowed to cool for 24 hours on a marble slab. [Ramon Castello, Provenza 240, Barcelona, Spain. British Patent No. 7703 (1915).]

New Machines and Appliances.

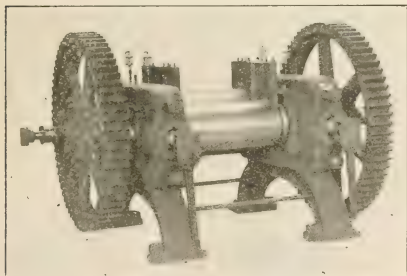
THE M. & W. HEAVY DUTY REFINING MILL.

THE mill embodies a number of improvements that are unquestionably of great advantage in mills of this type.

The illustration here shown represents a 14 by 20 by 30-inch, heavy duty double geared refining mill. It is of massive construction, the weight being distributed to adequately resist the heavy strains to which refiners are subjected. The housings are of the end cap type, made of semi-steel iron and provided with broad feet, which insure rigid attachment to the foundation plates. The end caps are cast steel and the cap bolts are made from chromium vanadium steel, making the completed housing capable of withstanding the heaviest strains.

The rolls are made of the best chilled iron, cored and fitted with stuffing boxes, water and steam connections for controlling the temperature of each roll. The roll bearing boxes are cast steel and bushed with phosphor-bronze, a pocket being provided to accommodate a quantity of grease, and sight feed oil cups are also provided for stimulating the grease, thereby insuring proper lubrication. The roll guides are cast iron with telescoping tee irons that fit the radius of the roll to the lowest possible point.

Another feature is the telescope gap guard fastened to the boxes and frame, completely covering the openings at the inside of the housings and preventing particles of rubber and other ma-



terials from getting into the bearings and gearing, resulting in considerable saving of materials as well as affording a protection to the lubrication.

The roll adjusting screw has a coarse, heavy pitch and is made of chromium vanadium steel. The bronze adjusting screw nut interlocks with housing so that it can be removed or inserted from the outside. The adjusting screw wrench is a special double-acting ratchet wrench and has a number of advantages, such as a time saver in adjusting the rolls (it being always in position for use), as well as the convenience with which adjustment can be made, as the operator can locate the lever to suit his convenience. [Morgan & Wright, Detroit, Michigan.]

DYKES' RELINER MOLD AND VULCANIZER.

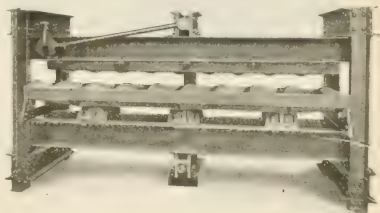
A machine that dispenses with all cores and wrapping and cementing operations necessary in the old method of making reliners, patches and inner shoes, is illustrated herewith. It combines in one machine both shaping and curing, the former by hydraulic pressure and the latter by heat directly applied.

The frame and bed are solidly built of I-beams to withstand deflection common to hydraulic presses of this type. The lower

platen carries the male reliner mold and is raised and lowered by three hydraulic rams. The upper platen is rigid and carries the female mold.

To make a complete reliner, the material is placed longitudinally on the lower mold and pressure applied to the rams which raise the lower platen and force the molds together. Heat is then admitted to the molds and in ten or twelve minutes the cure is complete and the reliner is ready for the stock room.

One man can operate two machines and easily turn out 200 reliners a day. By doubling up—that is, molding "two on" for each heat—the capacity can be increased to 400 reliners; depending on the length of cure. In making patches, material for 18 is placed on the mold of each machine. Allowing one hour for 5

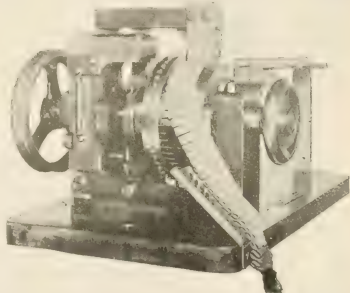


heats, the result will be 50 heats a day and the product, 1,800 complete patches. The machines are made in five sizes for 3-inch to 5-inch reliners and special size for patches, double hock shoes, lace and cylinder boots. [The Dykes Tire Shoe Machinery Co., Chicago, Illinois.]

THE WILLS RUBBER EDGING PLAITER.

This machine was designed with the object of producing plaited edgings from strips of rubber sheet. That it is practical in construction and efficient in operation is evidenced by the accompanying illustration showing the machine in operation.

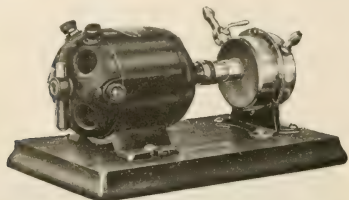
It is compactly built and mounted on a substantial base that may be fastened to any convenient bench or table. The strips of rubber are delivered from the feed table to the horizontal



plaiting head, on which the folds are made, and the plaits permanently cemented together. The machine is belt driven and will finish 30 inches of plaiting per minute. [Arthur Jackson Wills, North Brookfield, Massachusetts.]

TOY BALLOON INFLATING MACHINE.

The popularity of toy balloons as an advertising medium continues to grow remarkably, and manufacturers experience difficulty, not in securing orders, but in filling them. As these balloons are invariably supplied in a deflated state, the question of inflating several thousand of these little toys is rather perplexing unless one is familiar with the usual procedure. The accompanying illustration is the answer. It is, in fact, a small



electric motor attached directly to a small rotary blower, and can be placed on a table or desk and operated from an alternating or direct current service.

The neck of the balloon is slipped over the nipple that is seen in the picture, extending from the opposite side of the blower, and the motor started. When the balloon is inflated, the air is shut off by means of the hand valve and thread is tied around the neck to prevent the air from escaping. Thus it will be seen that balloons can be easily and cheaply inflated. The motor consumes current at the rate of an ordinary 16-candle-power lamp, revolving the blower at 1,500 revolutions per minute. [Dependable Manufacturing Co., Chicago, Illinois.]

MACHINERY PATENTS.

PERRAULT'S SOLE LAYING MACHINE.

ACCORDING to this method, the layers of sole stock are superimposed and simultaneously subjected to a rolling pressure and a vibratory movement imparted by vertically reciprocating rollers.

At the same time, the shoe is moved at right angles to the plane of reciprocation of the rollers.

In the accompanying illustration, *A* is the bed of the machine and *B* the last and shoe to which the rubber sole is to be applied. The last is mounted on a carriage *C* that travels back and forth under the vertical rollers, and is driven by a reversible lead screw.

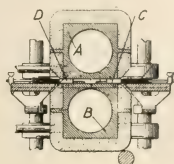
The first roller *D* is a straight-faced pressure roller operating on the central part of the sole. Following this, a pair of rollers *E*, arranged at an angle of 15 degrees, contact with the edges of the sole. These rolls are journaled in yokes, the upper ends of which are carried by eccentric shafts *F* and *G*, that impart a vibratory motion to the rollers. The two yoke heads are fastened to slides that have a limited vertical movement within a frame that is raised by a cable which passes over the top sheave *H*, then down and around sheaves *I* and *J* journaled in the bed of the machine. Here it is connected to a bell crank lever that is tripped by the forward

movement of the carriage, and lifts the reciprocating rollers from the sole on the return movement of the carriage.

The eccentric shafts *F* and *G* are driven by belts *K* and *L* from the countershaft *M*, that is in turn driven from the motor shaft *N* which also drives the carriage operating screw *O* by means of gearing shown at *P*. The return movement of the carriage is effected by a clutch operated by a pivoted fork and rod that cooperates with a lug attached to the carriage. A hand lever holds the clutch in neutral position and stops the carriage to permit the removal of the last and the replacement of a new one to be operated on. [J. E. Perrault, Belmont, assignor to Hood Rubber Co., Watertown—both in Massachusetts. United States patent No. 1,184,990.]

VULCANIZING BRUSH BRISTLES SET IN RUBBER.

This machine is designed to heat and vulcanize the rubber cement used to secure together the butt-ends of brush bristles. It accommodates a number of brushes of different sizes, and supplies pressure and heat at the particular point desired. The machine is constructed with six platens, arranged in pairs, one above the other, the upper platen of each pair being raised or lowered by separate vertical screws operated by hand wheels. The platens are all chambered for steam and the connections provided with swing joints to allow for vertical movement.

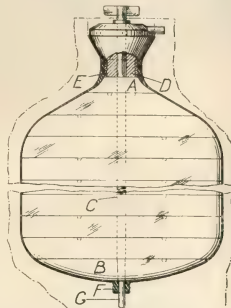


In the drawing, which illustrates a vertical section through a pair of platens, *A* is the upper and *B* the lower platen, both being heated by steam and covered with asbestos insulation. Two rows of brushes *C* and *D*, with the ferrule ends rubber cemented, are placed on the lower platen, when pressure and heat are applied until vulcanization is complete. [M. P. Tottle, Glyndow, assignor to William A. Tottle & Co., Inc., Baltimore—both in Maryland. United States patent No. 1,189,212.]

COLLAPSIBLE CORE FOR HOT WATER BOTTLES.

A core that can easily be removed through the neck of molded hot water bottles or similar goods, without injury to the article, is shown in the illustration. It is composed of ten

sections, *A* being the top and *B* the bottom section, all held in place by a rod *C*. The neck of the bottle is provided with a round plug *D*, through which the rod *C* passes, and fits within the threaded stopple ring *E* that is molded in the bottle neck. A recess at the lower part of the mold forms a nipple *F* for attaching a syringe tube, and *G* is a recess for centering the end of rod *C* in the mold. The operation is as follows: The sections of the core are assembled, being



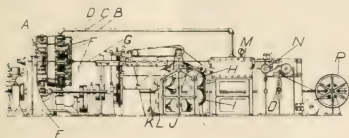
held in position by the rod, and the two mold halves are lined with calendered stock, the core inserted and the mold parts clamped together in the usual manner. After being cured, and when the mold is sufficiently cooled, the bottle is removed from the mold, and the rod and plug are withdrawn. This frees the top

core section *A*, which is removed by slightly stretching the neck of the bottle. The other sections are removed in a similar manner, after which the bottle is trimmed and finished. [E. Stahl and W. Klein, assignors to Goodyear's India Rubber Glove Manufacturing Co.—both of Naugatuck, Connecticut. United States patent No. 1,188,693.]

SUBER'S FABRIC STRIP MACHINE.

Cotton yarn is interwound and laminated upon a mandrel by this machine, forming a tube that is afterward impregnated with rubber, collapsed in band form, and then dried and wound up on a reel. These strips are used for building tire fabric, making rubber hose, belting and other rubber products.

The drawing is a side elevation of the machine. The four reels, *A*, *B*, *C* and *D*, rotate one within the other, the alternate reels revolving in opposite directions, and are supported by the standard *E*. Upon each reel is mounted a number of spools *F*, containing the yarn elements which are interwound around a centrally located hollow mandrel by the rotation of the reels.



The band passes over the mandrel through the solution chamber, and is shown at *G*, being fed to the drying roller *H*, and drums *I*, *J*, *K* and *L*. After passing over the drying rolls the band is carried through the chamber *M*, in which the solvents are recovered and then led through stretching rollers *N*, *O*, and finally wound up on the reel *P*. [L. A. Subers, Cleveland, Ohio. United States patent No. 1,188,571.]

In a more recent patent Subers provides a machine that impregnates the strands of yarn separately, prior to forming them on a mandrel, into a hollow band, and at a relatively larger angle than heretofore employed. [L. A. Subers, Cleveland, Ohio. United States patent No. 1,189,751.]

DAVIDSON LATEX COAGULATING CHURN.

According to this invention, the latex is churned to and fro in an oscillating cradle, the coagulant being added to the latex at the same time.

The illustration shows a side elevation of the machine, which is constructed of angle iron and strongly braced to support the working parts. The cradle *A* has upwardly curving ends, giving it a somewhat kidney shape in longitudinal section. The central part is open to receive the latex and coagulant, and a screen *B* is provided on the side from which the mother liquid is poured. The cradle is attached to four links, two of which, *C*, *C*, are shown, pivoted to the frame at *DD*. The oscillating motion is obtained by the pitman rod *E*, connected to the belt-driven crank disk *F*.

The coagulant tank *G* is connected to the auxiliary tank *H* that holds a quantity of coagulant, bearing a definite relation to the quantity of latex to be coagulated in the cradle. The

two valves *I* and *J* are connected so that when one is open the other is closed; thus when the bottom valve is closed and the upper one opened, the auxiliary tank is filled. When the top valve is closed the lower one opens, and the coagulant drips into the cradle and mixes with the latex.

In operation the latex is poured into the cradle to about one-third its capacity, the machine set in motion and the coagulant allowed to gently flow into the rocking cradle. When coagulation is complete the machine is stopped and the mother liquid poured out through a screen by tipping the cradle to one side, and the rubber is emptied from the other side into a deflecting chute that leads into a suitable receptacle. [S. C. Davidson, Belfast, Ireland. United States patent No. 1,189,351.]

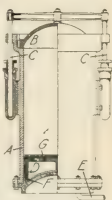
BATHING CAP PLAITING MACHINE.—A circular disk of sheet rubber is plaited and the plaits permanently cemented on this machine, which also operates on half and quarter disks and those with the center cut away. [F. F. Brucker, assignor to Miller Rubber Co.—both of Akron, Ohio. United States patent No. 1,186,374.]

HALE'S ATRON FEED FOR MILLS.—The apron is maintained in a taut condition when moved out of contact with its driving roll and in the inoperative position it is supported so that it will not fall into the pan or obstruct the front roll. [B. O. Hale, assignor to Farrel Foundry & Machine Co.—both of Ansonia, Connecticut. United States patent No. 1,189,444.]

NEW TIRE MACHINES.

A RAMLESS PRESS VULCANIZER.

THE steam chamber *A* of a hydraulic press vulcanizer serves also as the ram cylinder, and the upper cover *B* is raised by rams *C*, *C*. Water is admitted to the lower side of the piston *D* through a pipe *E*, and in its lowest position the piston is supported by a flange *F*. To reduce condensation, the upper part of the piston is covered with metal and asbestos sheets *G*. [J. H. Nuttall and D. Bridge and Co., Castleton, Manchester, England. British patent No. 978 (1915). This patent was briefly described in THE INDIA RUBBER WORLD, July 1, 1915.]



KUENTZEL'S BEAD FORMING MACHINE.

Endless straight side and clincher tire beads are made of threads or cords impregnated with rubber by a continuous winding process, on the machine here described and illustrated. In

the drawing, *A* is the vacuum chamber, *B* the condenser that produces the vacuum and *C* the rubber solution tank. The thread or cord is arranged on a reel *D*, journaled on bearings within the vacuum tank. When the valve *E* is opened, the partial vacuum causes the solution to flow from the tank into the vacuum chamber, submerging



all or part of the reel of thread.

The impregnated cord then passes out of the chamber, through a drying apparatus *F*, to the bead-forming machine *G*. This consists of a short belt-driven shaft journaled in a suitable frame with an annular bead mold *H* keyed to the outer end. A lining of frictioned fabric is placed in the groove of the bead mold, the end of the impregnated cord is adhered to the lining, and the mold revolved until sufficient cord has been coiled to

form the bead. During the winding operation the hand-operated pressure roller *I* is introduced into the groove of the bead mold, firmly compacting the threads. The finished bead is released from the mold by detaching the outer ring. [C. Kuentzel, assignor to The Republic Rubber Co.—both of Youngstown, Ohio. United States patent No. 1,187,339.]

COLE'S COLLAPSIBLE CORE

The rapidity with which tire casings are made depends to a great extent on the core, with relation to easy manipulation, and facility in removal from the vulcanized casing.

The drawing on the left is a front elevation, and on the right is an enlarged cross section, of a new collapsible core. The four core segments indicated by *A* are provided with the usual web *B*, terminating on the inner circumference with a projection *C*, that fits the groove in the outer annular clamping ring *D*.

When the core segments are assembled on the ring, they are held in alignment by the four plates *E*, that are clamped by tight bolts *F*.

When the casing is removed from the mold, after curing, the bolts are simply loosened and the plates withdrawn inwardly, which permits the removal of the core segments from the interior of the shaft in the usual manner. [J. C. Cole, assignor to Fisk Rubber Co.—both of Chicopee Falls, Massachusetts. United States patent No. 1,189,192.]

A FRENCH PRESS VULCANIZER FOR TIRE CASINGS.

This press is characterized by the arrangement of its controlling parts and the method of extension and retraction of the divided core.

The illustration shows on the right a perspective view of the press and on the left a vertical section.

The upper mold *A* is carried by a heating table *B*, which is attached to the platen *C*, that is operated by the hydraulic ram *D*. The lower half of the mold *E* rests on a heating table *F*, supported by the stationary bed-plate *G*. The core *H*, divided in segments, is supported by a plate *I* that is fixed to the ram *J*. This is hollow and acts as a cylinder for piston rod *K*, which is provided, at its upper end, with connecting links that control the extension and the retraction of the core segments.

The operation of the apparatus is as follows: To bring the upper platen *C* into the position it occupies in the illustration, pressure is introduced under the ram *D*. To release the core *H* from the lower part of the mold, pressure is introduced under ram *J*. Finally, to bring about the retraction of the core segments, the piston rod *I* is raised and the segments converge towards the center.

When the press is in this position, the casing is placed on the

core and the segments extended. It is then lowered in contact with mold *E* and pressure applied by the upper part of the mold *A*. Thus the casing is molded and vulcanized. It is then removed and the operation repeated. [A. Wolber. French patent No. 477,474 (June 17, 1914).]

MACHINES FOR REELING BIAS FABRIC STRIPS FOR TIRES.

The old method of placing bias fabric strips used for tire building between the muslin leaves of a "book" is apparently obviated by this new invention. Referring to the illustration, *A* is an elevation of the delivery end of a bias shear, and *B* indicates the delivery belts. *C* is the side elevation of one of six reeling machines that are placed alongside the shear, with sufficient space between them for the six operators. As the cut strips are advanced by the traveling delivery belts of the shear, they are removed by the operators to the reeling tables, where the ends are spliced together and the continuous strip *D* is wound up on the reel *E* by the hand wheel *F*. At the same time the liner strip *G* is wound between the strips of fabric.

Besides the saving of labor and the avoidance of the troublesome "books," it is claimed that a better splice is obtained by this method, due to the superior adhesiveness of the rubber fresh from the calender. [De Courcy Neal, Detroit, Michigan, assignor to Morgan & Wright, Detroit, Michigan. United States patent No. 1,189,724.]

TIRE BUILDING MACHINE. This automatic machine stretches and applies the fabric to the core smoothly, imparting an eccentric movement to the smoothing rollers that are mounted on a vertically swinging arm. [A. Mather, Zollikon near Zurich, Switzerland. United States patent No. 1,186,591.]

TUBULAR TIRE FABRIC LOOM. A tubular endless fabric, composed of single or multiple interwoven plies, is woven on this loom without stretching, pulling, packing or otherwise distorting the weave. [F. S. Dickinson, New York City. United States patent No. 1,188,418.]

CORD OR STRIP WRAPPING MACHINE. The core is rotated and the spools of material, mounted on the ends of two arms that revolve in opposite directions, apply the strip or cord circumferentially, beginning at the sides and continuing toward the middle of the core, where the two series of convolutions meet. [J. H. Coesir, Joplin, Missouri. United States patent No. 1,189,666.]

TIRE FLAP TRIMMING MACHINE.—The ragged excess material known as "flash" is trimmed from the tire flaps by two endless band cutters that operate in a manner similar to double band saws, severing the "flash" from the flap as it passes through the machine. [Thomas Midgley, Worthington, Ohio. Assignor to Morgan & Wright, Detroit, Michigan. United States patent No. 1,190,315.]

THE UNITED KINGDOM.

INNER TUBE MANDREL. This is tapered and made of a series of transverse cardboard or papier-mâché disks, surrounded by and supporting a tapering tube of similar material. When the tube has been spliced, the mandrel is dissolved, or reduced to pulp, by water or steam. [F. H. Hall, 6 Livery street, Birmingham, England. British patent No. 16,890 (1915).]

WIRE CORE FOR SOLID TIRES. A straight or wavy wire is inserted within the coils of the wire core before the rubber is forced or molded around the core. [Thomas Gare, Wemby, Middlesex, England. British patent No. 8,228 (1915).]

AIR-FILLED STUDS FOR SOLID TIRES. The hollow rubber studs are stiffened at the base by notched metal rings that are incorporated in the tire and vulcanized with it. [E. B. Killen and the Commercial Tire Co. British patent No. 11,070 (1915).]

British Standard Solid Tire Rims.

THE pioneer work in connection with the standardization of solid tire rims in Great Britain was undertaken by a select committee of the Society of Motor Manufacturers and Traders, Limited. From data obtained from the wheel and tire manufacturers it was found that there were 173 wheel diameters in use, all more or less closely approaching one another. The data were analyzed, and by a careful process of elimination it was found possible to reduce the number to 6 standard sizes, and at the same time cover practically all the requirements of the commercial motor industry, and these were finally adopted as British standards by the Engineering Standards Committee, the body which fixes and regulates British mechanical standards.

The task was a heavy one. It was found, for example, that where the suitable size of tire might be 900 by 120 millimeters [35.43 by 4.72 inches], the correct size of rim, as quoted by five of the principal manufacturers, was 719.8 millimeters [28.32 inches], 721 millimeters [28.39 inches], 740 millimeters [29.13 inches] and 742 millimeters [29.21 inches].

Further simplicity was afforded by dropping all reference to the outside diameter of the tire; every standard size being designated by the diameter of the rim on which it fits, together with the dimension for the width of the base.

The official report of the Engineering Standards Committee reads, in part, as follows:

1.—SIZES OF RIMS.

British Standard Solid Tire Rims for Automobiles shall be made to the outside diameters given in column 1 of the table, and shall measure at a temperature of 60 degrees F. not less than the minimum circumferences given in column 2 and not more than the maximum circumferences given in column 3.

1. Standard Outside Diameter.	2. Minimum Circumference.	3. Maximum Circumference.
Millimeters. Inches.	Millimeters. Inches.	Millimeters. Inches.
*670 26.38	2,104.9 82.83	2,107.9 82.95
720 28.35	2,262.0 89.06	2,265.0 89.17
*741 29.17	2,327.9 91.65	2,330.9 91.73
771 30.35	2,422.2 95.35	2,425.2 95.47
850 33.46	2,670.3 105.12	2,673.3 105.23
881 34.69	2,767.7 108.94	2,770.7 109.06

*The Committee recommends that for general use these sizes be dispensed with.

2.—MINIMUM WIDTH OF STEEL RIMS.

Where no raised flange is used the width of the rim shall be such as to provide not less than 10 millimeters [0.3937 inch] overhang on each side of the wheel beyond the tire base (see Fig. 1).

3.—LEAD TO FACILITATE FITTING OF TIRES.

A lead of 10 mm. [0.3937 inch] wide and 3 mm. [0.1181 inch] deep (see Figs. 1 and 2) shall be provided on one edge of the rim to facilitate the fitting of the tires.

4.—SLOTS TO FACILITATE REMOVAL OF TIRES.

In case of steel rims having fixed raised flanges the Committee recommends that the slots to facilitate the removal of tires (see Fig. 3) be spaced at equal intervals, round the rim and be not

less than 100 millimeters [3.937 inches] in width. For rims up to and including 771 millimeters [30.35 inches] in diameter the

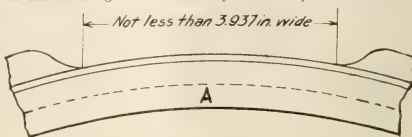


FIG. 3. SIDE ELEVATION OF FIG. 2 SHOWING SLOT.

slots shall be four in number, and for rims above 771 millimeters [30.35 inches] in diameter the slots shall not be less than four in number and have a combined length of not less than 600 millimeters [23.62 inches].

5.—TURNED FLANGE, OR PAD SUPPORTS FOR STEEL BLOCKS USED FOR REMOVAL OF TIRES.

The Committee recommended that either an turned flange (A, Figs. 2 and 3), or suitable pads or rests, spaced at equal intervals around the rim, be provided for the support of the tires.

6.—MARKING OF RIMS.

The rims of all wheels for solid tires which purport to comply with the British standard outside diameters and limits for circumference laid down in Clause 1 of this report, shall be marked on the external surface of the rim (as shown in Fig. 4) with the standard outside diameter (Column 1), and also with the letters B, S and the Committee's brand as *prima facie* evidence adduced by the manufacturer that the rims are in accordance with the diameters and limits laid down in Clause 1. The letters shall be not less than 10 millimeters [0.393 inch] high and the arrangement of the marking shall be as shown in Fig. 4.

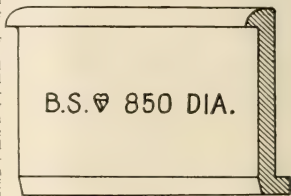


FIG. 4. EXAMPLE OF STANDARD MARKING FOR RIM.

7.—MARKING OF SOLID TIRES.

The Committee recommends that every solid tire be marked on both sides, in such a manner as to indicate clearly the width of the tire base and the diameter of the standard rim it is intended to fit; for instance, "120 for 850" [4.72 for 33.46 inches] would indicate a tire 120 millimeters [4.72 inches] wide to fit an 850-millimeter [33.46 inches] diameter rim. The figures are to be molded

on the tires, immediately following the marker's name, in the position shown in Fig. 5 and to be not less than 10 millimeters [0.393 inch] high.

A study of the table of standard rim sizes, given in the above report, shows that the limit of accuracy to which the wheels must be turned, and the tires bored, is fairly fine, taking into consideration the class of work. Such accuracy is justified, however, under the circumstances. It should be remembered that

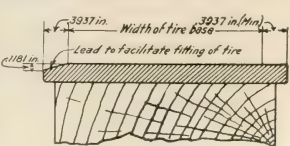


FIG. 1. STEEL RIM ON WOOD FELLY.

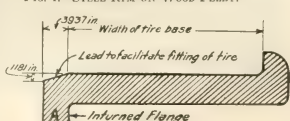


FIG. 2. RIM OF STEEL WHEEL IN SECTION.

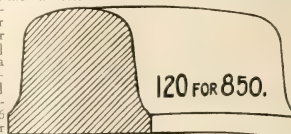


FIG. 5. EXAMPLE OF STANDARD MARKING FOR SOLID TIRES.

these tires must be pressed on so tightly as to remain in place under severe side thrusts delivered while the vehicle, and consequently the wheels also, are subject to considerable vibration, which naturally tends to loosen the band from the felly.

It will further be noted that in deciding upon the widths of wheel rims, care was taken to arrange for ample safeguard against damage being done to the tire, whenever the wheels run against the curb. In case of flangeless rims, a minimum of 10 millimeters (.3937 inch) is to be left projecting at each side of the tire. Where a flange is provided at one side, this allowance is demanded on the opposite edge of the rim. The edge of the rim is tapered to allow easy entry of the wheel into the tire.

In order that support may be offered for the steel blocks used when removing the tires, it is recommended that an intumed flange be provided; failing that, suitable pads or rests, spaced at equal intervals round the rim, would suffice.

AEROPLANE TIRES.*

NOW that increased attention is being given to the employment of aeroplanes as aids in national defense, it is interesting to note the part that tires play in their use. Aeroplane motors, like automobile motors, must be protected from jolts by pneumatic tires. In the earlier days all sorts of makeshifts were used; even bicycle tires were pressed into service on some of the pioneer machines. Some builders went so far as to use full size automobile tires. These were equal to the occasion as far as reducing the shock of landing was concerned, but were far too heavy and offered too much wind resistance.

The old type of aeroplane tire was costly and uncertain. Present day necessity has compelled tire dependability, as machines are now larger and heavier and must carry more passengers and heavier loads.

The development of tires to fit the peculiar requirements of the aeroplane began about five years ago. It was early discovered that resiliency was an important factor—that a live, springy tire actually aided the machine to get off the ground and helped to absorb the shock of landing. Experiments were made with cord construction, with the result that cord tires for aeroplanes have been refined to a point of efficiency equal to that of its successful big brother for electric and gasoline cars.

On aeroplanes, tires of large cross section are used to provide maximum cushioning ability to resist the lateral thrusts that occur when the machine side-swipes the earth in landing. On machines used for scouting in war, the cross section size is reduced one inch to reduce weight, thereby permitting the carriage of an additional amount of gasoline.

*By E. R. Preston, Aeronautic Dept., The Goodyear Tire & Rubber Co.

THE COMPRESSION INNER TUBE.

This type of inner tube is designed along new lines of construction with the object of avoiding pinching, rim cuts and puncture troubles.

It is extra thick and molded from Upriver fine stock, the diameter being larger in its normal cross section than that of the casing. The first illustration shows the tube in its normal position in the casing, before inflation. When inflated, as shown in the second illustration, the excess diameter and molded construction of the tube, it is claimed, produces radial compression that effectively

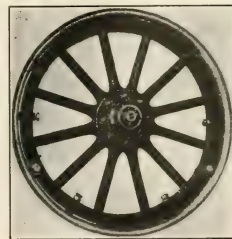
closes an ordinary puncture when the object is withdrawn. When fully deflated, the tube occupies a folded position apparent in the illustration that permits a car of ordinary weight to run a limited distance on the rim without injury to the casing or tube. It is said that the heavy walls of the tube require less air pressure and prevent the majority of blow-outs.

While these tubes are more expensive than the ordinary inner tube, the extra service and immunity from tire troubles are said, by those who have used them, to be worth the difference in price. [Compression Inner Tube Co., Louisville, Kentucky.]



THE PARKER DEMOUNTABLE RIM AND WHEEL.

Two patents of interest to the rubber tire industry were granted recently to Orrel A. Parker, manager of the Hydraulic Pressed Wheel Co., Cleveland, Ohio. The most important in



relation to tires covers a rim that apparently avoids the Perlman claims by providing four simple bolts and two clamps, the former exerting a radial and the latter a lateral pressure in attaching the rim to the felly of the wheel. Dowel pins are provided on the rim opposite the locking devices to take the thrust of the drive.

The second patent provides means for attaching the rim directly to the spokes of an all-metal wheel. In this, the alternate spokes are provided with radial locking screws and lateral clips of substantially the same construction as those set forth in the principal patent.

The illustration shows the application of the Parker demountable rim to a wooden wheel of the ordinary type.

The Automobile Club of America has recently accumulated data on the cost of operating large town cars, shown in the following table, in which the monthly tire expense is given:

It would seem that these figures are excessive; however, the weight of the cars and the fact that they were driven by chauffeurs must be considered.

	COST PER MONTH OF OPERATING LARGE TOWN CARS.						Per Cent of Total Cost.
	A	B	C	D	E	Average	
Miles traveled	51 HP	38 HP	38 HP	32 HP	25 HP	848	
Fuel consumed, gallons	883	903	862	1,005	590	848	
Cost of fuel at 30 cents a gallon	175	141	147	121.5	119	140.7	
Cost of fuel at 30 cents a gallon	\$52.50	\$42.30	\$44.10	\$36.45	\$35.70	\$42.21	27.6
Cost of lubricants	2.17	1.59	.87	2.73		1.45	.9
Tire expense	54.95	50.91	39.31	48.78	33.89	45.57	29.9
Insurance	17.14	29.13	10.35	13.80	7.47	15.58	10.2
Storage	40.00	40.00	40.00	40.00	40.00	40.00	26.2
Supplies, license fees	13.66	4.14	3.54	15.36	2.76	7.91	5.2
Total	\$180.42	\$168.07	\$138.17	\$157.12	\$119.82	\$152.72	100.0

Demountable Motor Trucks.

THE demountable wheels and steel flanges fitted over regular truck wheels, permitting a motor truck to travel on railroad tracks, are not new.

There are, however, only two such devices worthy of attention and their value is limited, owing to the time and trouble necessary to change a truck over from solid tires to flanges.

One of these devices is a flange wheel, made similar to a regular railroad wheel, which replaces the regular truck wheel. A truck so equipped must change wheels every time it leaves the rails or leaves the road for the rails.

The other is an endless flange rim, made to fit over the S. A. E. band, and is applied by hydraulic pressure the same as the pressed-

on type tire. To use this flange it is necessary to remove the tires, and it is also necessary to employ hydraulic pressure of not less than 25 tons.

Neither of the above mentioned devices are practical for military purposes, and consequently are of no value to the army.

In May of this year Mr. Wales of the Riker Motor Truck Co. conceived the idea of making a flange in two pieces. He submitted his idea to Captain J. R. Lee, who is in charge of motor transportation for the punitive expedition at Columbus, New Mexico, and as Captain Lee encouraged the idea, Mr. Wales referred the matter to A. L. Riker, who is in charge of engineering matters at Columbus.

Mr. Riker, however, who designed a sufficient number of flanges for the truck and sent them to the army base at Columbus.

Upon the arrival of the flanges Captain Lee equipped a three-ton Riker truck with them, and ran the truck over the tracks of the El Paso & Southwestern Railroad from Columbus to El Paso and return, a distance of 146 miles, without any trouble whatever. The truck carried a crew of 20 men, each man being equipped with complete field equipment, and ran on regular railroad schedule, with a railroad conductor in charge, as an extra train, at an average speed of 18 miles per hour. The gas consumption for the entire trip was practically the same as would have been the case had the truck been driven for the same distance over

the difference in the running of the truck was in the vibration. This vibration was

slightly in excess of the motor vibration in traveling on the streets. Up to a speed of 19 miles this vibration was harmless but of such force as to prohibit a greater speed.

Another noticeable feature was the fact that the truck ran

better loaded than empty, on account of traction, for with an empty truck there was considerable slippage.

Of the illustrations, Fig. 1 shows one-half of the flange. Fig. 2 shows the flange complete, while Fig. 3 shows a truck equipped and ready for service on a railroad. The flange is so constructed as to fit over the tire with the inside edge resting on the steel base or steel fastenings of the tire. In case of a dual wheel the inside edge of this flange rests on the center wedge ring. It does not come in contact with the tire or wheel at any other point. Two bolts are then fitted at each joint and drawn up tightly, which causes the edge of the flange resting on the center or inside flange of the wheel, to be drawn up with sufficient pressure to eliminate all danger

CONCLUSION.

In starting the experiment at Columbus, the truck was driven up to the railroad track, the flanges were applied on all four wheels in 20 minutes' time, requiring four men. The truck was then driven on the track, and on arrival in El Paso, the truck was stopped at a street intersection and the flanges removed in 16 minutes, thrown on the truck and the truck driven over the streets to the hotel. In the opinion of Captain Lee, who conducted this test, these flanges are a complete success, their superiority over other devices of a like nature being the fact that it is not necessary to remove the wheels nor tires to apply them. Their value to the army cannot yet be estimated, but the fact that these trucks can be operated over bridges and road-beds where heavy locomotives would break through, and also the fact that on encountering washouts, these flanges can be removed, and the truck driven around the obstruction, all with a minimum amount of expense and time, practically assures that they will be used by the United States army more extensively than anyone realizes at this time. It is hardly possible that they will ever be used on the main lines of any railroad except for rapid transportation of troops on emergency calls. Their chief field of operation will be on branch lines, or lines constructed to suit the convenience of the army.



FIG. 3. TRUCK EQUIPPED WITH THIS DEVICE ON TRACK.



FIG. 2. THE FLANGE COMPLETE.

the weight of these flanges is about 250 pounds each. They are made of cast steel. In case they were made of pressed or rolled steel this weight would be reduced easily 50 per cent.

Should be on every rubber man's desk—Polyglot Rubber Trade Directory, 1916; Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon.

New Goods and Specialties.

RUBBER WATCH PROTECTOR.

For all M. workers, mechanics, repairmen, trammens, locomotive and steamship engineers, sportsmen, automobilists, hunters, millmen and farmers will find in these rubber cases a neat and convenient protection for their watches.



For electrical workers a protective watch covering is an absolute necessity, and the one shown in the first illustration is especially designed for this purpose. Being made entirely of rubber, the case affords perfect insulation against electricity. It covers the watch completely, stem and all, and the corrugations on the back of the case, shown herewith, prevent the watch from slipping out of the pocket.

This case is attached by removing the

ring from the stem of the watch and pushing the stem through the neck of the rubber case, adjusting the watch so that it fits snugly in the protector. The ring is then replaced and the watch chain snapped to the rubber.

In attaching the non-stem rubber case, also shown, the ring of the watch need not be removed. This style of case is useful for those who do not come in contact with electricity, but desire to protect their timepieces from dust, dirt, or water. [All-proof Watch Protector Co., Oakland, California.]



RUBBERIZED BATHING ACCESSORIES

Sea-bathing today calls for many accessories, if one follows the dictates of fashion. Besides the bathing suit, the cap to cover the hair, and the shoes, the fair sex turns to the beach now



requires cushions on which to recline while taking the air and sun-bath on the sands before or after the sea-bath. And the fashion is to have these cushions elaborate in material and make-up. The need of water-resisting qualities in such pillows has resulted in the use of rubberized mummy-silk of various colors, brilliant hues predominating, the figures or designs being of solid color, cut from this cloth and cemented or applied

over the basic material. Three pillows of this character are shown, all of which are proving popular as novelties at the fashionable watering places. [L. C. Studios, New York City.]

HORIZONTAL SPRAY WITH RUBBER BALL

A small opening in the rubber ball at one end of the perforated metal cap, in the bathtub spray device here illus-



trated, is forced up over the spigot, when the temperature and pressure of the water may be regulated with the hot and cold water cocks. A horizontal shower or needle bath is thus furnished, without wetting the head, although, if desired, it is also an effective shampoo spray. This

attachment, which measures scarcely two inches in length, may be easily carried by tourists and traveling men, and affords a great convenience in all homes not equipped with stationary showers. [John Howard McElroy, Chicago, Illinois.]

NOVEL VACUUM CLIP.

A novelty in vacuum hangers is the combination with it of a spiral spring, which assists in creating the vacuum to enable it to attach more firmly than would the rubber cup alone, and



also relieves direct tension upon the neck of the cup. This cup also has an inner core, which, it is claimed, adds still further to the adhesion.

To this is attached a spring clip which will hold anything from a sheet of paper to a curtain stick, and the main purpose for which it

is recommended is to hold a curtain so that it will not flap in the wind, if the window is open. However, this is only one of many uses for the "Put-me-on" as it is called. It can be used to suspend show cards or small articles in store windows, or brushes and toilet articles in the houndoir or bath room, or special memoranda on the office desk. It is small and inexpensive, and is efficient in many ways which will suggest themselves in the household, store or office. [Knight & Christensen Co., Chicago, Illinois.]

THE McDERMOTT HYDRAULIC FORCE CUP.

In the drain pipe provided for all sinks and wash basins there is necessarily a trap, and in this, organic waste matter collects, gradually filling up the pipe. The McDermott hydraulic



force cup is designed to enable the householder to remove this accumulation, and thereby save both plumbers' bills and—through prompt eradication of an unsanitary condition—doctors' bills as well. This force cup is similar in appearance to those operated by air pressure, but a

rubber hose is attached to the water faucet—fitting any size—and the force of the water is utilized to clean out the pipe. [John McDermott, New York City.]

RUBBER LIFT FOR LOUIS HEELS.

While rubber heels and half-heels are plentiful, and of various shapes and sizes, their use has been confined mainly to broad heeled shoes. It was not until recently that any endeavor was made to give to wearers of women's high heeled shoes the advantage of resiliency, soft tread and non-slip qualities, which such heels afford. Now, however, rubber heel lifts are made expressly for the Cuban and Louis heels which are so fashionable today. The cut shown is a "Maltese Cross" special size heel made expressly for this purpose, the cut being the exact size of the base of the heel lift, which is attachable to either wood, leather or fiber heels



by three screws, which, being countersunk below the surface of the lift, allow play for the resiliency of the rubber, thus affording the elastic tread so desirable in such goods. [Gutta Percha Rubber, Limited, Toronto, Ontario, Canada.]

RUBBER HOSE PROTECTOR.

A novel attachment for garters, which is claimed to prevent drop stitches even in the thinnest stockings, consists of a thin rubber disk, with a small hole in the center, which allows it to be slipped over the stud of the garter, lying directly over the base plate. In this manner the sharp edges of the metal parts of the garter are cushioned and prevented from cutting the threads of the stocking. The disk need never be removed except for cleansing, which can readily be accomplished with soap and water. [No-Tear Hose Protector Co., Portland, Maine.]

**"UNIQU" RUNNING BOARD FOR FORD CARS.**

The running board here shown is built on a sound wood base, specially treated to prevent warping or swelling. It is covered with heavy corrugated rubber, the edges being bound with heavy aluminum or brass moldings securely fastened with nickel-plated or brass screws. A full set of bolts is furnished with each pair of boards, and each bolt is covered with a shell of aluminum or brass, so that it cannot rust and spoil the appearance of the car. The "Uniqu" running boards greatly improve the looks of the car, and are claimed not to rattle, rust nor sag in the middle, as do the iron boards. [The C. Spiro Manufacturing Co., New York City.]

**RUBBER LINED TOBACCO POUCH.**

The pipe or cigarette smoker appreciates the convenience of a well-made tobacco pouch, and manufacturers produce many varieties, each having its distinct and individual merits. A new pouch is made of fine quality leather, with a snap button as fastener. The special feature of this pouch is its rubber lining, which enables it to retain the moisture of the tobacco, thus keeping it in the proper condition to give the most enjoyment to the smoker. This "Sportsman's Tobacco Pouch," as it is called, is made in tan and black leather and is an article which



should find ready sale, in those stores which carry a line of smokers' articles. [H. J. Collis Manufacturing Co., Taunton, Massachusetts.]

RUBBER CEMENTED BRUSH.

The brush for automobile painting or varnishing and similar uses, shown herewith, is guaranteed by the manufacturer to withstand the most severe usage and remain intact until entirely worn out. In its manufacture, the butts of bristles or



hair in these brushes are saturated with pure plastic rubber in a semi-liquid state and then vulcanized, thus firmly attaching them to the handle of the brush and eliminating the defects present in the ordinary brush, which cause annoyance in painting and varnishing. [John L. Whiting-J. J. Adams Co., Boston, Massachusetts.]

A RACQUET GLOVE.

The tennis player knows the value of a first class racquet, and well understands the advantage of keeping the most vulnerable part, the stringing, in proper condition. No player can do good work with a flabby, loose-stringed racquet, and unfortunately the gut strings lose their effectiveness if allowed to absorb dampness. To properly preserve the racquet, and to protect the stringing from moisture, a "racquet glove" has been placed on the market. This is shown in the illustration. It is of fine quality cloth, coated with Para rubber. It is shaped to fit the racquet and is provided with a strap, which has a snap fastener. [Nathan Novelty Manufacturing Co., New York City.]

**AUTOMATIC ELECTRIC SWITCH FOR AUTOMOBILES.**

The usual practice in automobile electric wiring is to protect the batteries against grounds or short-circuits by installing a fuse on each circuit. The blowing of a fuse invariably occasions annoyance to the motorist who is obliged to find the fuse block, often placed where it is hard to get at, locate the fuse which has blown—not always an easy matter—and put in a new fuse, providing he has one available.

The automatic lighting switch here illustrated combines the functions of a lighting switch and overload circuit breaker, and in the latter capacity acts as the usual fuse block, instantly breaking the circuit when a ground occurs, and positively indicating such a breakage by throwing out a small button which is visible underneath the lighting switch control key. To again close the circuit it is merely necessary to push the button in, and if it remains in this position, it is certain indication that normal conditions are restored.



A similar automatic switch is marketed for ignition circuits, also a combined ignition and lighting switch, working on the same principle. Both of these are designed to prevent the draining of the battery, should the driver neglect to throw the switch off when the engine is stopped.

The bases of these ingenious devices are made of molded hard rubber with the terminals embedded in the same material, thus insuring perfect insulation. [Hartman Electrical Manufacturing Co., Mansfield, Ohio.]

FORD REAR WIND-SHIELD.

Protection from cold winds, dust and dirt has long been afforded the driver of an automobile by front wind-shields. The accompanying illustration shows a rear wind-shield which gives



the same protection against the elements for the passengers that the driver enjoys. This convenient addition to the comfort and pleasure of motoring is made of heavy rubber cloth with transparent partitions, and may be readily attached to the top, and to the back of the front seat

AN INTERCHANGEABLE RUBBER HEEL.

Few people wear the heels of their shoes uniformly—some wear down the outside of the heel, others the inside, while almost everyone wears off the back of the heel rather than the level tread. Rubber heels when worn down lose their resiliency, of course, as the thickness of the rubber is reduced. Therefore it has been found desirable that the heels might be interchangeable, so that when worn off on one side they could be reversed from one shoe to the other, and thereby give longer service than would otherwise be possible.

A heel made for this purpose is shown in the illustration, both the upper and under surface being presented. When on the shoe it differs in no respect from any other makes of rubber heels. The application to the shoe, which also allows for the interchangeable feature, is explained by the pictures. A metal fastener is attached to the

shoe, over which the heel is then sprung through its resiliency. The method of application is to lay the heel, with the fastener in place, upon the prepared leather heel; then a light blow on the rubber heel will cause the "dogs" or points on the fastener to mark the exact position in which the fastener is to be nailed. This fastener is then removed from the rubber heel and nailed securely in place. The rubber heel is then sprung over the fastener, and the concave surface springs flat and seals the joint between the shoe heel and the rubber heel. Of course, it is a simple matter to remove such heels, and transfer them to the opposite shoes after they have been run down on one side. The heels cannot be pulled off accidentally and will not crowd or shift out of place. They are made in various sizes for men's and women's shoes. [The Nolan Rubber Co., St. Paul, Minnesota.]

ANTERIOR-METATARSAL ARCH SUPPORT

Most arch supports are intended to raise the arch extending from the heel to the ball of the foot, and many and varied are their forms and composition. As is well known, there is another



arch in the human foot, that across the ball, at the bases of the toes; in anatomical language, the anterior or metatarsal arch. A disarrangement of the bones of this arch is the cause of severe suffering. To overcome and remedy this a special arch is made. It is claimed that the construction of this support is such that adjustment may readily be made to fit the form or structure of the bones of the foot, by means of the pocket placed in the upper end of the support into which the user places the specially devised pad of rubber molded to conform with scientific accuracy to the natural contour of the anterior metatarsal arch. This arrangement enables the user to adjust the pad in the exact position which affords greatest relief. The contact of the rubber pad against the upper layer of soft, flexible leather and the bottom layer of felt, holds the rubber pad in the position in which it has been placed, and its use tends to bring the bones back to their proper position. [Nathan Novelty Manufacturing Co., New York City.]

RUBBER IN THE NURSERY.

The inventor of the rubber bib, besides sharing in the sure profits of the present, is in line for the promised reward to the benefactors of the little ones. The rubber bib is not a new article of manufacture. It is not improbable that it has been a source of comfort to babies since grown up to engage in its



manufacture and sale; but it does contribute to a child's comfort, offering relief from the irritating effects of the frequent spilling of milk over the neck and chest. Neither is the nurse's rubber apron new, its practical utility having been for some time recognized. The styles shown in the illustration, however, are in new decorative materials, the effect being quite different from the bibs and aprons hitherto in vogue. [Currie, Thomson & Co., London, E. C., England.]

THE TREO ELASTIC GIRDLE.

This is a new elastic girdle. It is made entirely of a washable, porous, surgical woven elastic, boned front and back with rust-proof steels, the front ones being of the new French soft top variety. It is suitable alike for growing girls and adults, and for bathing and athletic, as well as ordinary wear. Each girdle has four hose supporter straps of firm, substantial elastic with padded loops and all-rubber buttons. This corset is made in various materials, in white and pink, and is from 7 to 16 inches in length. [M. W. Schloss Manufacturing Co., New York City.]

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

The Editor's Book Table.

OF THE RUBBER AND COMPANIES, 1916. COMPILED BY THE
 Managing Directors and Rubber Shareholders' Association, Limited,
 and published by "The Financial Times," London, England. [Board
 cloth. Price, 75c. 1916. Pp. 354.]

THIS volume is a compendium of information regarding the 532 rubber-producing companies in the Middle and Near East giving, as it does, the capital authorized, the capital issued, acreage, production, dividends, profits, the secretaries, boards of directors and much miscellaneous information of interest to investors or planters. Besides these, there is a supplementary section covering companies in the Far East. There are also estimates for the current year and outputs to the beginning of May; details of new land to be opened up, the highest and lowest prices of shares for several years, a complete list of directors and secretaries of rubber companies. These facts and figures are in most cases official. The work is well printed and admirably arranged for quick reference.

TRACTION RESISTANCE TO A MOTOR DELIVERY WAGON ON
 Different Roads and at Different Speeds. By A. E. Kennelly and
 O. R. Schweig. Presented at the Annual Convention of the American
 Institute of Electrical Engineers, Cleveland, Ohio, June 27-30, 1916.

In this paper is given a complete report on an investigation of tractive resistances of urban roads to a motor delivery wagon equipped with solid rubber tires. The "tractive resistance" as used in this paper, includes still-air resistance, but does not include wind resistance and the resistances internal to the truck. The test truck is fully described, with its driving mechanism and the storage battery which supplied the motive power. The investigation involved test runs over definite lengths of road, at measured truck speeds, to determine the gross battery output during these runs; and laboratory tests to determine the overall efficiency of the truck between battery terminals and rear-wheel treads at speeds and loads corresponding to the road tests. The results included in the paper are (1) overall efficiency of truck mechanism and (2) tractive resistances of a number of typical urban roads. The components of tractive resistance for a typical road are also given.

RAILWAY EXTENSION IN LATIN AMERICA. BY FREDERIC M.
 Halsey. From Monthly Magazine & Book Co., 35 Nassau Street, New
 York. (Cloth. 8vo. 100 pages, illustrated. Price \$1.50.)

While this book is avowedly written to interest capital in a line of investments which is unfamiliar, to most Americans, it is far from being a book of dry facts and statistics. Rather, it is an entertaining account of the origin and development of the principal railway systems in Central and South America, giving many facts of the mechanical and engineering difficulties as well as the climatic conditions which were overcome, and briefly outlining the history of each of these enterprises. The story of the Madeira-Mamoré Railway is given in detail, though no facts are presented which have not been covered by THE INDIA RUBBER WORLD. Mr. Halsey suggests that a number of the larger South American railway enterprises, controlled abroad, be invited to make formal application to list their securities on the New York Stock Exchange, believing that when American capitalists become acquainted with the Latin-American investment field, they will doubtless be able to finance various new projects in those countries, where hitherto European capital has predominated. The book is neatly bound, has 40 half-tone engravings and four maps, showing the extent and location of the South American railways.

THE LEGHORN INTERNATIONAL EXPOSITION. PUBLISHED BY THE
 Panama-Pacific International Exposition, San Francisco, California.
 (Hanging. 1916. 100 pages. Price 50c.)

This book is a compilation of the opinions of over 700 well-known Americans regarding the great exposition which was

held in San Francisco last year. The sentiments are many and varied; they come from commanding figures in politics, science, art, transportation, business and literature, and also include many from prominent American women, the whole forming a permanent record of the comments of leading minds as regards the exposition, in its various phases. It is a beautiful book, which will delight bibliophiles, it being very novel in its manufacture. It is printed on toned antique paper, sewed on tapes after the book-making art of four centuries ago. A ruled scheme gives separate panels for the body text, the running heads and the side heads, the type matter being black and the rules red, to match the hand-made paper of the covers, while the backbone is of unbleached linen with a Japanese vellum title.

NEW TRADE PUBLICATIONS.

THE B. F. Goodrich Co., Akron, Ohio, is publishing a series of route books for the use of automobilists and we have just received copies of those for New York and New Jersey, as well as one entitled "Electric Car Tours in New England." These books are carefully compiled and give a great amount of exact information valuable to anyone touring the sections covered. Each book contains a map of the territory, and this is followed by instructions regarding the routes from one point to another. The large cities are also mapped to show the ways of approach and exit, while each tour is also shown in the same way. The routes are given concisely and clearly, showing the direction and the number of miles between every two points on the route. Where the Goodrich company has erected road marker guide posts at the corners, these are indicated by a character showing the way to turn; this, of course, being in addition to the verbal directions. The New York route in the New York book has in its central pages an outline map of the state, showing the number of miles between each important point. It is a book of 160 pages, of convenient size to carry in the pocket, as are the others mentioned. Undoubtedly, these books, which are offered free to motorists, will have a large circulation.

The Goodrich Company is sending out to the shoe trade a finely printed pamphlet exploiting the new "Textan" soles and Goodrich heels for the shoe manufacturing trade. The illustrations are printed in natural colors, and folded within is a chart showing the shapes, sizes and thicknesses of the soles and heels described in the body of the work.

The Goodyear Tire & Rubber Co., Akron, Ohio, publishes a general catalog for dealers which gives a large amount of information regarding such goods as are usually carried by automobile accessory dealers and repairers. Many of the articles listed are illustrated by clean, clear half-tones, and a considerable amount of information regarding the goods and their methods of use, guarantees, etc., is added.

The Racine Rubber Co., Racine, Wisconsin, sends out a brilliantly colored folder advertising its tires, a portion of the circular showing a bird's-eye view of the plant, while a map of the United States has 37 cities indicated, at each of which there is a distributor of the Racine company's tires, the names of these distributors being given in tabular form below.

"Shoveling Coal by Machinery" is a 16-page pamphlet crowded full of information regarding the various methods

of handling coal by means of the conveyor belts made by the Link-Belt Co., Chicago, Illinois. The text is by Henry J. Edsall, M.E., and the diagrams and illustrations give one a very full and complete idea of the efficiency of these methods. A supplementary chapter deals with a conveyor for coal and ashes, also well illustrated.

William H. Scheel, New York City, importer and dealer in chemicals and specialties for manufacturers in various trades, has just issued a buyers' list, giving the complete line of products carried by him, some 200 in number, of which about 75 are used in the manufacture of rubber goods. The list is in compact form and handy for quick reference.

JUDICIAL DECISIONS.

HOOVER RUBBER CO. vs. UNITED STATES RUBBER CO. AND OTHERS. Six of the defendants were manufacturers of lasts used in making rubber footwear, and were the only makers thereof in the United States. The United States Rubber Co., with the intent of restricting and controlling the interstate sale and transportation of lasts, made separate agreements with each of the last manufacturers whereby they agreed to sell no lasts for a certain fixed period, except to persons and corporations specified by it. By means of these agreements it deprived the plaintiff of the ability to procure lasts.

The court held that, where it did not appear that any of the last manufacturers intended to restrict and control trade, or knew of the contracts between the rubber company and other last manufacturers, there was no combination or conspiracy in restraint of the trade, and the last manufacturers were within their rights in making the contracts, and were not liable. But the court held that the action of the United States Rubber Co. was a domination of the trade and control, as used in the plaintiff's declaration, and was the substantial equivalent of monopoly as used in the statute.

Therefore, the court sustained the demurrers of all the defendants except the United States Rubber Co., whose demurrer was overruled. [The Federal Reporter, Vol. 229—page 583.]

PENNSYLVANIA RUBBER CO. vs. DREADNAUGHT TIRE & RUBBER CO. The court of trial held that the defendant was guilty of unfair competition in its markings and sale of certain tires known in the trade as "seconds," and entered a perpetual injunction enjoining such markings. The Dreadnaught Co. did not appeal from this part of the trial court's decision, but from another part concerning the sale of other tires in which the court of trial held "that, unless in connection with the sale and disposition of the defendant's 'seconds,' the bill cannot be sustained" and entered a decree "that in other respects the bill of complaint be and the same is hereby dismissed."

The Federal Circuit Court of Appeals, Third Circuit, held that, where a bill alleging unfair competition made no mention of any trade-marks of complainant, or the violation thereof, and it appeared that when complainant called defendant's attention to defendant's alleged violation of its rights, no mention was made of the use of any alleged trade-mark, the case would be treated as one of alleged unfair competition, though argued as though it involved a trade-mark.

That, where it did not appear that any intending purchaser of complainant's automobile tire had been misled, or could be misled, by the markings of the defendant's tire, into buying defendant's tire under the belief that he was getting complainant's, no case of unfair competition was established. The court below having fully and satisfactorily discussed the case, the Court of Appeals affirmed its decree, with the addition that the bill be dismissed without prejudice to complainant's right to renew the same, if any confusion of goods should thereafter develop in the course of trade. [The Federal Reporter, Vol. 229—page 560.]

RUBBER TRADE INQUIRIES

These inquiries that follow have already been submitted, under the assumption they are of interest, not only to our readers, but to the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

[192.] Names and addresses of manufacturers of safety vulcanizers have been requested.

[193.] Inquiry has been received for the name of a maker of machines for cutting rubber sheets in small pieces, for making combs.

[194.] Concerns manufacturing machinery for the pulverizing of scrap rubber are sought.

[195.] A correspondent requests names of manufacturers of machinery used for making insulated wire.

[196.] Inquiry has been received for the addresses of tennis ball manufacturers.

[197.] The address of a dealer in M. R. hydrocarbon has been requested.

[198.] Another inquiry has been received during the month for names of manufacturers of sponge rubber.

[199.] A correspondent requests the name of the manufacturer of the "New Year" hot water bottle.

[200.] Information is sought regarding the process of manufacturing of hard rubber set shaving brushes.

[201.] A jobber of advertising novelties desires to add toy balloons to his line.

[202.] The address of a manufacturer of dipping machines is requested.

[203.] We are asked for the names of manufacturers of glass and porcelain dipping molds.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS

A firm in Spain desires agency for that country for a first class line of pneumatic tires. Report No. 24192.

An agent of a large American steel company in Chile wishes to represent an American manufacturer of fire hose. An order can be placed immediately, it is stated, for from 5,000 to 8,000 meters of canvas fire hose (from 16.404.15 feet to 26,246.64 feet), a sample of which may be inspected at the Bureau or its district offices. As the demand for this hose is urgent, quotations are desired by cable, giving the price on board at Valparaiso per meter, the conditions of payment, and the approximate date of shipment. Report No. 21,702.

LATE CUSTOMS RULINGS

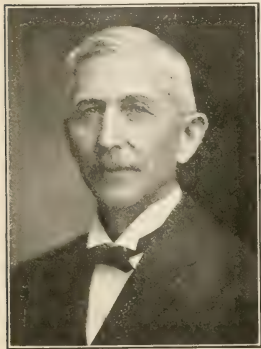
The Harshaw, Fuller & Goodwin Co., Cleveland, Ohio, protested the collector's assessment of 15 per cent on bone black as a pigment. The importers claimed that the merchandise was used as a bleaching material in the manufacture of cream of tartar and tartaric acid, and that it was never used as a pigment. The customs examiner who passed the goods testified that a mistake had been made and the board sustained the claim for free entry under the provision in the law for bone black not suitable for use as a pigment. Reliquigation was ordered.

According to a recent decision of the United States Court of Customs Appeals, gutta jelutong, commonly known as Pontianak, is classified with spruce gum, and dutiable as a non-enumerated, unmanufactured article. The Treasury Department therefore has instructed that jelutong and other similar crude gums, not drugs, shall be classified at the rate of 10 per cent ad valorem on importations made 30 days from May 12, 1916.

THE OBITUARY RECORD.

A VETERAN RUBBER MANUFACTURER.

JAMES H. SEIBERLING, president of the India Rubber & Insulated Wire Co., Jonesboro, Indiana, died at his home July 7. He was born in Summit County, Ohio, November 25, 1835, and educated in the common schools of that county. He lived with his parents on the farm and assisted in the operation of a sawmill until 1840, at which time he formed a partnership



JAMES H. SEIBERLING.

with his brother, J. F. Seiberling, for the manufacture of farm implements and a general foundry business. A year later the brother's interests were taken over by S. H. Miller, and these two men continued their association in business up to the time of the death of Mr. Seiberling. In 1890 he went to Grant County, Indiana, taking an active interest in the oil and gas business then developing at that point, and was thus instrumental in the founding of

Gas City, Indiana. In that year he also organized the Indiana Rubber & Insulated Wire Co., and became its president and general manager, retaining this office until the time of his death.

Mr. Seiberling joined the Lutheran church at Doylestown, Ohio, at an early age, and remained to the end a consistent member. During his residence there he was superintendent of the Sunday school for 27 consecutive years.

He married Elizabeth Baughman in 1860, and to this union six children were born, of which A. F. and R. W. survive, both of whom are officers in the company.

Mr. Seiberling was an inventor of considerable note of rubber machinery, tires, etc.—and as a pioneer in the branch of the rubber industry with which he was affiliated, he formed a wide circle of prominent and influential friends who mourn his loss.

HEAD OF A RECLAIMING COMPANY.

John R. Trewin, president and treasurer of the Stockton Rubber Co., Stockton, New Jersey, died at Mercer Hospital, Trenton, on July 10, subsequent to an operation. Mr. Trewin was 48 years old. He was born in Flemington, New Jersey, and educated in the public schools there. He entered the employ of a clothing concern in Flemington and later became proprietor of a retail clothing establishment in Lambertville, New Jersey.

In 1905 he became associated with E. K. Price and O. A. Blackwell, forming the Stockton Rubber Co. Mr. Blackwell retired in 1907, when his stock was purchased by D. J. Price, vice-president of the company.

For the last five years Mr. Trewin made his residence in Trenton, New Jersey, where he was a member of Masonic bodies and the Elks. He is survived by a widow.

FREDERICK C. BREAKSPEAR.

Frederick C. Breakspear, general manager of the rubber factory of A. G. Spalding & Bros., at Chicopee Falls, Massachusetts,

died recently in New York City. Mr. Breakspear was one of the veterans of the Spalding organization with a service record which began with the old Peck & Snyder firm in 1875. From his first position as errand boy, his progress was steadily forward, one promotion following another during his service with that concern, and continuing when the Peck & Snyder firm was acquired by A. G. Spalding & Bros. in 1890.

Mr. Breakspear was placed in charge of the Chicopee factory in 1894 and occupied that position to the time of his death. His life was a conspicuous example of what conscientious zeal, ability in one's line and singleness of purpose can accomplish—traits of character which, together with a pleasing personality, brought their rewards of confidence and lasting friendships.

Mr. Breakspear occupied a position of large influence in his home town. He was for many years a park commissioner of Chicopee Falls, and at his death was president of the Manufacturers' Association there.

BUILDER OF A LARGE BUSINESS.

George E. Austin, manager of the Imperial Rubber Co., New York City, died suddenly at his home in Brooklyn last Monday of heart failure.

Mr. Austin was born in London, England, 50 years ago, and received his education in that city. On graduating from the high school he entered the employ of the London Rubber Works. He came to this country in 1886, connecting himself with the Commonwealth Rubber Co., New York City, and two years later established the Imperial Rubber Co., developing an extensive foreign and domestic business in belting, hose and other mechanical goods. Later he added to his business a line of bicycles, conducting this as the Imperial Cycle Co. of New York City. In 1891, with George M. Ayres, he formed a partnership under the name of the Duplex Rubber Co., to deal in mill supplies and mechanical goods.

Mr. Austin was a man of wide acquaintance, ambitious and energetic, and the Imperial Rubber Co. is the practical result of his activity and business acumen. He leaves a widow and two married daughters.

A PIONEER IN THE BRITISH TIRE TRADE.

Charles Challiner, joint managing director of the Shrewsbury & Challiner Tire Co., Limited, died suddenly at his home, Manchester, England, on June 15. He was 67 years of age and a native of Tinsley, near Sheffield, where his early business life was devoted to the engineering trade. Later he moved to Manchester and engaged in the solid tire business in a small way, which rapidly grew under his able management. His business ability and inventive genius have made his name prominent in the development of the solid tire industry of Great Britain, among his inventions being the cup tire for carriages, and the cross-ribbed tires largely used on motor fire engines. He is survived by his brother, Walter Challiner, who is still connected with the Shrewsbury & Challiner Tire Co., Limited; his eldest son, C. S. Challiner, secretary of that company; and two other sons, J. A. Challiner and T. Challiner, also in the tire trade.

A PROMINENT JAPANESE EXPERT.

Yutaro Yoshida died on the 20th of May. He was superintendent and technical expert of the Toyo Rubber Co., Limited, which is one of the leading rubber manufacturing companies in Tokio, Japan.

The Electric Storage Battery Co., Nineteenth street and Allegheny avenue, Philadelphia, Pennsylvania, is having plans drawn by the William Steele & Sons Co., 1600 Arch street, Philadelphia, for the erection of a seven-story reinforced concrete and brick factory addition, 115 by 117 feet, at a cost reported to be about \$300,000.

News of the American Rubber Trade.

NEW OFFICE BUILDING OF FISK RUBBER CO.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, has just moved into a fine, modern six-story office building of cut stone and brick. The building contains every modern device which makes for organization and efficiency. The whole basement of the building is used for a check room. On the ground floor, at the main entrance, is a spacious reception hall, at one side of which is an information bureau. This floor contains the purchasing, traffic and engineering departments. On the second floor are the service and architectural departments, and the advertising department, which also occupies a portion of the third floor. The third floor is occupied by the correspondence department and the mailing room, and here one large and well-furnished room is set apart exclusively for the use of the office boys. On this floor, also, is the telephone exchange and a private branch of the Western Union Telegraph Co., and the general manager's office and the stenographic department. The fourth floor is given over to the accounting department. The fifth floor contains the offices of the president and vice-president, as well as the statistical department. On the sixth floor are large conference rooms, the president's private dining-room, a cafeteria which will accommodate about 300 at one time, the private dining-room of the heads of departments, and a thoroughly equipped kitchen. Elevators run the full height of the building, and from the sixth floor to the basement, at the rear, is a specially constructed brick fire-escape tower which can be entered from each floor.

RESALE OF THE B & R RUBBER CO. PLANT.

At the auction, sale of the B & R Rubber Co., North Brookfield, Massachusetts, on the 25th of June, the property was bid off to Thomas G. Richards, president of the company, for \$228,000, the next highest bid being \$227,000 by his former partner, Charles C. Beebe. This sale was made subject to the approval of the United States Court. When the matter came up before the judge on July 12, it was found that a bid of \$233,000 had been offered since the auction, and the court therefore ordered that the sale be re-opened on July 19, at 11:30 A. M., at the office of the company, with the same auctioneer. This sale was advertised to be subject to an upset price of \$265,000, on which the receivers reserved the right to waive if they deemed it advisable. The sale was held at the time appointed, and T. G. Richards was again the purchaser at \$256,000 which, although \$91,000 less than the advertised upset price, was approved by the court.

DUPONT INTERESTS PURCHASE FAIRFIELD RUBBER CO.

The Fairfield Co., one of the subsidiaries of E. I. duPont de Nemours & Co., has purchased the Fairfield Rubber Co., Fairfield, Connecticut, and will operate the concern on the same lines as heretofore. The Fairfield company manufactures a rubber carriage cloth, and employs about 100 men. The home office has been transferred to Wilmington, Delaware, but it is not thought that there will be any change of importance at the plant. It is said that the Fairfield company has large contracts in this country and abroad; in fact, these contracts are rumored to be large enough to keep the plant busy for a year. If expansion is determined upon there is plenty of room at the Connecticut plant, which has several acres of vacant ground adjoining.

E. W. Harrell, president of the company, who has been associated with it since 1880, has retired, and has been succeeded by R. R. M. Carpenter, president of the Fabrikoid Co. and one of the directors of the duPont corporation.

ANNUAL CONVENTION OF THE FAULTLESS RUBBER CO.

The annual convention of the Faultless Rubber Co. was held at Ashland, Ohio, from the 20th to the 22nd of July, inclusive. There were approximately 70 representatives of the company present and the period of meeting was divided between business and pleasure. The convention was opened by Sales Manager W. H. Balch, whose initial remarks took the form of thanks to those present for their effective cooperation during the year just passed. This was followed by a discussion of the advertising and selling campaign of the company by H. S. Lett, advertising manager of the Faultless Rubber Co., and M. P. Gould, of the M. P. Gould Co. of New York, who has general charge of Wearaver advertising. In the evening a dinner and musicale were given by President T. W. Miller, at his beautiful residence, and Friday, the 21st, was devoted to a tour of the factory, conducted by President Miller and Superintendent C. E. Campbell. Subsequently Mr. Miller delivered an address outlining the policy for the coming year. This was followed by interesting remarks by Messrs. Balch and Gould. Saturday, the 22nd, was devoted to concluding business and the departure of delegates to their respective homes.

RUBBER COMPANY DIVIDENDS.

The United States Rubber Co. paid a quarterly dividend of 2 per cent on the first preferred stock and a quarterly dividend of 1½ per cent on the second preferred stock of the company, on July 31, to stockholders of record July 15.

The Kelly-Springfield Tire Co. has declared a quarterly dividend of 4 per cent on common stock, payable August 1, to stockholders of record July 17.

At a meeting of directors of the B. F. Goodrich Co., held July 26, a dividend of \$1.75 per share on the preferred stock was declared, payable October 2, to stockholders of record September 21; also a quarterly dividend of \$1.00 per share on the common stock, payable November 15 to stockholders of record November 3.

The New Jersey Zinc Co. has declared an extra dividend of 10 per cent, payable August 10 to stockholders of record August 1. The regular quarterly dividend of 4 per cent has been declared, payable August 10 to stockholders of record August 1.

RUBBER COMPANY SHARE QUOTATIONS.

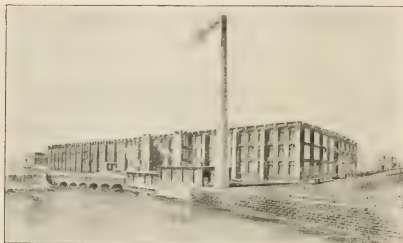
The following market quotations of shares of rubber manufacturing companies on July 25 are furnished by John Burnham & Co., 115 Broadway, New York City, and 41 South La Salle street, Chicago, Illinois:

	Bid.	Asked.
Am. Rubber Co. (new)	64	65
Firestone Tire & Rubber Co., common	915	930
Firestone Tire & Rubber Co., preferred	111	115
The B. F. Goodrich Co., common	73	74 1/2
The B. F. Goodrich Co., preferred	113 1/2	114
Goodyear Tire & Rubber Co., common	22 1/2	23
Goodyear Tire & Rubber Co., preferred	106	106 1/2
Kelly-Springfield Tire Co., common	71 1/2	72
Kelly-Springfield Tire Co. 1st preferred	96	97 1/2
Miller Rubber Co., common	200	215
Miller Rubber Co., preferred	104	106
Portage Rubber Co., common	113	116
Portage Rubber Co., preferred	115	117
Sundback Tire & Rubber Co., common	85	87 1/2
United States Rubber Co., common	52 1/2	53 1/2
United States Rubber Co., preferred	108 1/2	109

The National Rubber & Specialties Co., Cincinnati, Ohio, has increased its capital stock from \$20,000 to \$100,000. The officers of this company are as follows: C. L. Bonfield, president; G. M. Allen, vice-president; G. W. Drach, secretary and treasurer, and J. E. Bancroft, general manager.

THE CONNECTICUT MILLS CO.'S NEW ACQUISITION.

The Nemasket Spinning Mill at Taunton, Massachusetts, lately acquired by the Connecticut Mills Co., Inc., Danielson, Connecticut, has been reorganized under the name of the Taunton Cotton Mills Co. The mill has 30,000 spindles and will give



about 6,000,000 pounds product, somewhat less than two-thirds of the consumption of yarn at the Danielson factory. This is independent of the 3,000,000 pounds product of fabric at the company's Canadian plant at Sherbrooke, Quebec, which contains its own spinning equipment.

DOUBLES BY GEOMETRIC PROGRESSION.

The Morse Chain Co., Ithaca, New York, manufacturer of the "Morse Rocker-Joint Power Transmission," used in many rubber mills, has increased its capital from \$400,000 to \$1,500,000, for the purpose of greatly enlarging its plant. The business was established in Trumansburg, New York, in 1904, and two years later removed to a new factory at Ithaca, double the size of its former one. Six years later the plant was enlarged to more than twice its former capacity, and present plans contemplate again doubling the size of the plant. The addition of a large storage building is nearly completed, and additions to the steel and wire mills, and a new gas producer building are well under way. The main building is to be increased to more than 900 feet in length, and when these additions are all completed, the company will have a total floor space of approximately seven acres.

CONVENTION OF THE CONTINENTAL SALES STAFF.

The third annual convention of the sales staff of the Continental Rubber Works, Erie, Pennsylvania, was held in Erie last month. The attendance embraced branch managers from New York, Chicago, and San Francisco agencies and factory representatives from Middle and Atlantic States and from the South and Southwest. The convention lasted a week, combining business and pleasure, including daily conferences, dinners, luncheons, motor rides, picnics and country club diversions. This company has, under the efficient direction of Theron Palmer, become one of the important rubber manufacturing organizations of the country.

KAUFMAN RUBBER CO., LIMITED.

The representatives of the Kaufman Rubber Co., Limited, Berlin, Ontario, Canada, during the week of June 19, held an important conference at the company's headquarters in that city. The branch managers came from all parts of Canada, and the object of the convention was to discuss business topics and to plan the campaign for the coming season. The entire plant was inspected under the direction of Manager A. R. Kaufman and Superintendent J. H. Roedding. There were business sessions for the discussion and interchange of business views, and between times, various entertainments, such as automobile rides, a clam-bake, and a banquet at one

of the principal hotels, at which several interesting addresses were given. A handsome bear rug was presented to Manager A. R. Kaufman, and a set of leather-upholstered living-room furniture to Sales Manager W. E. Wing. The business of the company was reported as excellent and the output this year will be larger than ever before.

TRADE NOTES.

The Willard Storage Battery Co., 274-276 East One Hundred and Thirty-first street, Cleveland, Ohio, will erect four new buildings in addition to its present plant. These buildings will cover 150,000 square feet, and when completed will double the present floor space. The new power house and plant will be modeled along the lines of the best engineering practice and 40,000 amperes at 110 volts will be generated.

Joseph Chalfin, well-known dealer and importer of scrap rubber, has removed his offices from 36-38 Whitehall street, New York City, to 42-44 Whitehall street, where he occupies larger quarters, equipped with every convenience.

A newly organized rubber concern is the Scioto Rubber Co., located at 5th avenue and the Big Four tracks, Columbus, Ohio. The plant is well equipped for the manufacture of clothing, toy balloons, and hospital sheeting. The officers are C. M. Linthicum, managing director; Guy C. Bowman, president; C. F. Johnson, vice-president, and C. L. Lamont, secretary.

The Lycoming Rubber Co. (U. S. Rubber Co. factory), Williamsport, Pennsylvania, recently inaugurated a graduated bonus system for the encouragement of apprentices while learning the making of rubber footwear. The schedule in force shows that the first week apprentices will receive 75 cents per day. After that they will receive piece-work pay and a bonus graduated down from \$2.00 the second week to 50 cents the eighth week, after which straight piece work rate will be paid. Any girl whose entire ticket is transferred from tennis to gum shoes will receive similar graded bonuses for the first seven weeks.

T. J. Jones, for twenty years with the Mechanical Rubber Co., Cleveland, Ohio, where he was manager of the belting and hose department, and for the past three years assistant general manager of the Ohio Rubber Co., of that city, has recently incorporated the latter concern, which deals in mechanical goods, canvas belting and tires.

In THE INDIA RUBBER WORLD of June 1, 1916, a note appeared to the effect that we understood that W. M. Mackintosh contemplated starting a factory in the neighborhood of Montreal for the purpose of treating fabrics with "Galbulose," of which he is the inventor. Mr. Mackintosh writes that the information we received was somewhat premature. The use of this process and material is already established in Canada with two concerns, and is showing satisfactory results, and Mr. Mackintosh predicts a great future before it in several directions. At present the inventor is not promoting a company, his time being practically monopolized as a specialist in a munition factory.

GOODYEAR TIRE & RUBBER CO. PROMOTIONS.

M. D. Montgomery, who has been acting as manager of the Denver, Colorado, district for the Goodyear company during the illness of the late S. E. Gillard, has been appointed to the managership.

F. C. Moyer, formerly in charge of the Des Moines, Iowa, branch, is now branch manager at Minneapolis, Minnesota, succeeding G. H. Barmore, who has been made manager at the Milwaukee, Wisconsin, branch. The position of manager at Des Moines has been filled by F. W. Telford, formerly supervisor of motor truck tire sales in Chicago, Illinois.

The branch managership at El Paso, Texas, left vacant by the death of G. F. Dennis, has been placed in the hands of T. J. Fitzgerald.

VERNON ROYLE.

THIRTY-FIVE years ago the first Royle tubing machine was put into service. At that time the name Royle was unknown to rubber manufacturers. Today it is no exaggeration to say it is a household word throughout the trade.

Although not the original inventor of the process of making rubber tubing and allied forms, by forcing a plastic mass through a die, the development of the tubing machine has been so largely the personal work of Vernon Royle, the subject of this sketch, that he may be justly termed the father of this method of producing formed rubber products.

Born in Paterson, New Jersey, on June 9, 1846, Vernon Royle received such education as the local schools of the time afforded, supplementing this by individual study and work, largely along

mechanical lines. His first real experience of the elements of machine design and construction began with his apprenticeship to the pattern-making trade, which he mastered thoroughly in his father's shop and elsewhere, and later, through his connection with the old firm of Vanderburg, Wells & Co., makers of printers' furniture, wood type, etc., in New York, in ante-bellum days. Here young Royle's aptitude for mechanics led to his being placed in charge of the routing department, where he became familiar with the merits and defects of the routing machine, a fact that was not without a determining influence on his future career, as it was his intimate knowledge of routing machines, that in later life enabled him to develop the router that has made the name of Royle famous and which proved the foundation of the Royle success.

Illness terminated Mr. Royle's career with Vanderburg, Wells & Co., and there followed a year of battle for health; then seven years as secretary of the Board of Education of Paterson, followed by two years as Commissioner of Education. In 1880 he embarked on what proved his life work by forming a partnership with his father, John Royle, Sr., and his brother, John, Jr., for the prosecution of the machine business under the name of John Royle & Sons, under which name the concern has existed uninterruptedly to the present time.

The first Royle tubing machine was produced in 1881. This followed roughly the lines of a crude experimental machine already in existence, but was the first attempt to build a rubber machine with some pretensions to mechanical excellence. Judged by the machines of today, it was crude enough, yet it marks a distinct advance and was eagerly accepted by rubber manufacturers as the most efficient machine of its type in existence. It was, in short, the first tubing machine of real practical value.

It would extend this brief review unduly to mark the various steps by which the Royle tubing machine, as it is today, was developed. Detail after detail was made the subject of special study with a view to increasing the range of the machine and its productive capacity, all being finally brought together in the

perfected tubing machine as now made, a machine with a productive capacity at least six times as great as the earlier machines, while its range has been extended to include sizes and classes of goods formerly deemed entirely outside the range of the tubing machine. Continuous-length garden hose, for instance, is an example of the adaptation of the machine to meet a new demand, while many auxiliary devices for use in connection with tubing machines were invented, including strainer heads for reclaiming rubber, three-way heads for the same purpose; special insulating heads for making rubber packing; compound screws and dies for marbled tubing, etc.; also a very important machine, the circular loom for weaving seamless fabric coverings for steam, fire and garden hose. This machine was first placed on the market as the Royle-de Laski loom, from which has grown the present Royle circular loom, a type involving many important modifications of the original model. Two sizes are made, one for garden hose, the other for coverings up to eight inches in diameter.

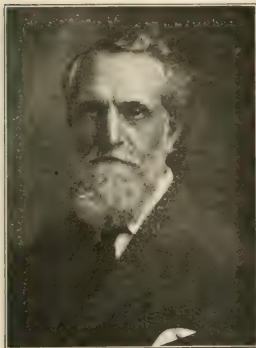
Parallel with the development of the tubing machine proceeded the development of the insulating machine, a machine broadly similar to the tubing machine, but so modified as to permit of the application of seamless insulating coverings to wires and cables. Prior to the introduction of this machine, insulating compounds were commonly applied in strips by strip-covering machines, the raw edges of the strips being supposed to unite under pressure in the machine. The method answered well enough, but was essentially defective as the seam was a source of weakness. The Royle insulating machine corrected this, as it applied the covering in an absolutely seamless, homogeneous form, and hence proved a revolutionary machine in its field.

This, in brief outline, has been Vernon Royle's contribution to the rubber industry—the work of a lifetime summarized in a few words, yet so numerous have been Mr. Royle's inventions in this field, that 17 patents, embracing over 196 claims, have been granted him for his purely original work.

Nor has the rubber trade been the sole field of Mr. Royle's activities. Since 1880 he has been a dominant figure in the mechanical branches of photo-engraving, and in jacquard card cutting for silk weaving, in both of which lines, his inventions have been accepted as representing the highest achievements in efficiency. From a purely mechanical and technical standpoint, these lines are more interesting than the rubber line, involving, as they do, machinery of the most delicate and accurate construction, both in design and workmanship. In both lines, Royle machines are widely popular, the photo-engraving machinery, in particular, being used in every civilized country in the world and some rather uncivilized ones as well. In the case of tubing and insulating machines, 73 patents in all have been issued to him covering 671 claims.

At 70 years of age Mr. Royle is as active as ever in the conduct of his business and is still devising new things. His latest work includes improved motor-driven, positive-action take-offs for tubing and insulating machines, and he is now designing a tubing machine that will take dies up to 6 inches in diameter.

In addition to his activities in the field of mechanics, Mr. Royle has always taken a broad interest in the civic affairs of his native city, having served as a Commissioner of Education and as an officer of the Taxpayers' Association, serving on the committee charged with solving the difficult problem of sewage disposal in the Passaic Valley. At the present time, he is a director of the Hamilton Trust Co., a leading financial institution of Paterson, and of the Cedar Lawn Cemetery Co., to both of which he devotes considerable time. He is also a member of the American Society of Mechanical Engineers; the Masonic fraternity; the Hamilton Club and the New Jersey Historical Society. Mr. Royle is of Scotch-English descent and was married in 1872, his wife dying in 1908. He has two sons, Heber and Vernon E., both of whom are associated with him in business.



VERNON ROYLE.

NEW INCORPORATIONS.

Alma Rubber Manufacturing Corporation, June 30 (Delaware), \$100,000. Joseph A. Berger, L. Edward Dean, John F. Rau—all of Chicago, Ill. Principal office, 8 S. Dearborn street, Chicago, Ill. To manufacture rubber tires, tubes and all other rubber goods and material used in same.

Armored Tire Co., July 3 (Maine), \$100,000. Ernest L. McLean, Augusta, and E. M. Leavitt, Winthrop—both in Maine. To manufacture and sell automobile tires and reliners for automobile tires and pneumatic tires and reliners of any and all descriptions.

Atlantic Rubber Manufacturing Co., Inc., July 7 (New York), \$15,000. William Schrader and William Ehlers, of 337 Broadway, New York City, and Felix Schwemer, 402 First avenue, College Point, L. I.

Buckeye Tire Co., The, May 24 (Ohio), \$5,000. R. S. Graves, R. H. Woolley, C. W. Shields, John Bleska, and S. W. Lewis.

Burrill Tire Co., The, May 9 (Massachusetts), \$200,000. Frank H. Burrill, Charles Noll, Edward F. Loughlin—all of Concord Junction, Massachusetts. Principal office, Concord, Massachusetts. For the purpose of manufacturing and selling at wholesale and retail a certain patented device known as the Burrill Tire Tool for removing rims from automobile tires.

Colonial Braid Co., Inc., June 12 (New York), \$10,000. Robert F. Dreuge, 1126 Fox street; Sylvia Kaipf, 564 West 149th street—both in Bronx; and C. Agnes Berard, 541 16th street, Brooklyn—all in New York City. To manufacture elastic braid, etc.

Chicago Tire Co. of America, Inc., July 20 (New York), \$100,000. S. Bernheim, 35 Nassau street, New York City; C. A. Weldon, 591 Seventh avenue, and Harry J. Jacobson, 555 Grand street—both in Brooklyn, N. Y.

Corcoran Tire & Rubber Co., May 18 (Ohio), \$5,000. Thomas J. Corcoran, Jacob A. Hollander, Charles E. Weber, Phil W. Tozzer, and T. M. Miller.

Dorman-McClelland Tire & Supplies Co., July 5 (Iowa), \$10,000. F. E. Dorman (president); Tom McClelland (vice-president); Robert McClelland (secretary and treasurer), all of Davenport, Iowa. Principal office, Davenport, Iowa. To sell and repair tires and other auto accessories.

Duplex Tread Tire Co., June 13 (Indiana), \$10,000. Edward C. and Lucile Meisner, and Samuel G. Boyer. Principal office, Terre Haute, Indiana. To manufacture auto tires.

Eagle Rubber Co., The, June 1 (Ohio), \$50,000. H. R. Gill, Harry V. Pohle, J. E. Arnold, J. W. Dash and Clyde C. Sherick. Principal office, Ashland, Ohio. To manufacture toy balloons, rubber novelties, sundries, etc.

Fibre Web Co., April 27 (Indiana), \$15,000. W. E. and L. W. Bundy, and D. H. Snapp. Principal office at Kewanee, Indiana. To manufacture fiber board.

Kansas City Tire & Accessory Co., April 14 (Missouri). Glenn R. Donaldson (president), B. B. Weldon (vice-president), and Tom C. Schroeder (secretary and treasurer). Principal office, 1518 Grand avenue, Kansas City, Missouri. To deal in tires and automobile accessories.

Keystone Metallic Tire Co., May 18 (Delaware), \$100,000. Franklin L. Mettler, Walter R. Mull, Alfred Whartenby—all of Wilmington, Delaware. Principal office, 702 Market street, Wilmington, Delaware. To manufacture and sell insulated and non-insulated metallic ties for steel, electric and other railways.

Lee Tire Co., June 27 (Tennessee), \$5,000. G. M. Seewald, F. R. Rouse, R. F. Seewald, J. M. McKernan and Earl King. Principal office, Memphis, Tennessee.

Non-Skid Co. of America, June 7 (Massachusetts), \$200,000. Robert M. Clark, Newton Centre; Albert H. Harrington, Fall River; E. Clifford Potter, 50 Congress street, Boston—all in Massachusetts. Principal office, Boston, Massachusetts. To

manufacture and deal in motor vehicles, parts, accessories, tools and appliances, and apparatus and machinery for making the same.

Overture Service Co., Inc., June 16 (New York), \$1,000. Philip Rosenberg, 121 Hopkins street; Isaac Slutzky, 344 Jay street, and Abraham Kempner, 2021 Cropsy avenue—all in Brooklyn, N. Y. Principal office, Brooklyn, N. Y. To manufacture and deal in all kinds of tires.

Pan-American Rubber Co., June 29 (Wisconsin), \$200,000. F. J. Kamler, H. C. Clausen and N. J. Kopmeier. Principal office, Milwaukee, Wisconsin. To manufacture and deal in rubber goods.

Standard Album Corporation, March 21 (New York), \$10,000. Jennie H. Betts and Julia E. Byzyee, 410 Riverside Drive, New York City. To deal in pictures, leather, rubber goods, etc.

Stein, A. S., Inc., July 10 (New York), \$500. Arthur S. Stein, Jersey City, N. J.; George J. Constable, 354 Ocean avenue, and Henri Pressprich, 256 79th street—both in Brooklyn, N. Y. To deal in auto tires and tubes.

Tempest Waterproofing Corporation, June 15 (New York), \$10,000. W. Tempest, 234 Central avenue, West Hoboken, N. J. Charles C. Turner, 67 West 104th street, and Herbert Tempest, 71 East 11th street—both in New York City. Principal office, New York City. Waterproofing fabrics.

Thomas & Guzman Co., Inc., July 19 (New York), \$10,000. William W. Thomas, Octavia J. Thomas, A. M. Lazarowitz—all of 51 Leonard street, New York City. To deal in tires of all kinds.

Tire Co. of Baltimore, Inc., July 10 (New York), \$100,000. Sydney Bernheim, 305 West 72nd street, New York City; Catherine A. Weldon, 591 Seventh street, and Harry H. Jacobson, 555 Grand street—both in Brooklyn, N. Y.

Triangle Packing Co., The, March 17 (New York), \$100,000. Edward H. Letchworth, Fritz Fernow, Walter M. Wilkins, 12 Cleveland Place, Buffalo, New York. To manufacture packing.

Twin Tube & Rubber Co., June 26 (Delaware), \$1,000,000. George W. Dillman, F. D. Buck, M. L. Harty—all of Wilmington, Delaware. Principal office, Delaware Charter Guarantee & Trust Co., 328 DuPont building, Wilmington, Delaware. To manufacture and deal in inner tubes, solid or pneumatic tires, rubber shoes, rubber heels, etc.

Washington Tire & Rubber Co., May 16 (Delaware), \$250,000. E. P. Altenberg, East Palestine; F. H. Grove, Columbiaria; G. P. Wilson, Steubenville—all in Ohio. Principal office, United States Corporation Co., 311 South State street, Dover, Delaware. To manufacture and deal in rubber tires and tubes.

CANADIAN CONSOLIDATED PICNIC HUGE SUCCESS.

The natal day in Canada, July 1, is celebrated annually as "Dominion Day," and on this occasion the annual picnic of the employes of the factories of the Canadian Consolidated Rubber Co., Limited, and the Canadian Consolidated Felt Co. was held at West Side Park, Waterloo, Ontario.

Over 5,000 people were in attendance and the all-day program of sports was highly enjoyed. Valuable prizes were given for the different events, which included amusing features such as frog and wheelbarrow races, pie eating and watermelon contests, and a Mutt and Jeff race.

A tug-of-war inter-company contest between the Kimmel felt factory and the Berlin felt factory against the Merchants Rubber Co. and the Dominion tire factory resulted in victory for the Dominion tire team; while in the relay inter-company race the Merchants Rubber team conquered.

Refreshments were served in abundance, and two excellent bands provided music.

TRADE NOTES.

Charles E. Miller, Anderson, Indiana, has just completed a new brick addition to accommodate the increased demand of the rubber department. This structure adds about 3,500 square feet of floor space to the factory. A second addition is in early prospect.

It is said that the McGraw Tire & Rubber Co. will erect a warehouse at 135 Mt. Royal avenue, Baltimore, Maryland.

The Lee Tire & Rubber Co., Spring Hill, Pennsylvania, has resumed operation after the annual Fourth of July and stock-taking suspension.

Thomas Midgley has petitioned to enjoin the Lancaster Tire & Rubber Co. from using the word "Midgley" in connection with its products, his contention being that the Lancaster company has not lived up to an agreement made at the time he severed relations with the company, that at the expiration of three months, the use of his name in connection with its tires would be discontinued.

More than 1,000 employes of the McGraw Tire & Rubber Co., East Palestine, Ohio, have formed the McGraw Rubber Club, a social organization. To keep in touch with the activities of the club, a bright little four-page paper, entitled "The Rubber Leaf," is to be published, bi-monthly. Lewis E. Stein is the editor.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, has equipped all the new Indian motorcycles of the machine gun company of the Second Regiment, M. V. M., bound for the Mexican border, with "Red Top" motorcycle tires, free of charge. The labor troubles which have kept the tire makers away for three weeks have been finally settled, and they are now back at work.

The Continental Rubber Co., Sandusky, Ohio, is erecting a two-story building, 50 by 200 feet, on West Monroe street. It is expected that the plant will be ready for operation by November 1, with a capacity of 200 tires a day. H. H. Herman, formerly with the Firestone Tire & Rubber Co., will be superintendent.

The Hester Tire & Rubber Co. has obtained a site at Lima, Ohio, upon which a main factory building, 60 by 150 feet, and a power house, 60 feet square, are to be erected. The company officials state that work on the buildings will soon be started, and machinery will be installed before early fall. The capacity of the plant will be 100 tires per day and 100 men will be employed. A second building for the manufacture of motor truck tires is also contemplated.

The B. F. Goodrich Co., Akron, Ohio, has opened a pneumatic tire service station at Yosemite National Park, Yosemite, California. This store will be under the jurisdiction of the San Francisco branch and will be in charge of S. M. Wynne.

The Blow Tire Sealer Co., at 21st and Race streets, Philadelphia, Pennsylvania, is putting a new tire sealer on the market.

The Kelly quick detachable wire wheel is now to be manufactured and aggressively marketed by the Craftsmen Motor Corporation, Chicago, Illinois.

The Bates Puncture Plugger, a plastic preparation for use in tires, is said to be a most effective resistant to punctures, and occupies but 5 per cent of air space. It is the invention of Edgar L. Bates, a western chemist, and controlled by Paul Richey of the Russell M. Seeds Co., Indianapolis, Indiana.

The Pan-American Rubber Co., Milwaukee, Wisconsin, notice of whose incorporation appears elsewhere in this issue, takes

over the business of the Sporn Tire Co., which has been manufacturing inner tubes for about ten months. Factory quarters have been leased in the Kopeier building, and a large production is planned. F. J. Ramler is president and general manager of the new company. Mr. Ramler is half owner of the Standard Racine Rubber Co., Milwaukee, and a large stockholder in the Racine Rubber Co., Racine, Wisconsin, having been engaged in the rubber and tire business for more than 16 years.

The Chicago, Illinois, branch of the Fisk Rubber Co. has been removed from 1440 Michigan avenue to new quarters at 2508 Michigan avenue, with a service station at 53-59 East Twenty-fifth street. The new office is complete and up-to-date in every detail, the building being two stories high, with basement, and having a 40-foot frontage and 190-foot depth. Wayne Murray, for five years in charge of this company's business in Texas, is manager.

CHANGES AT GOODRICH DEPOTS.

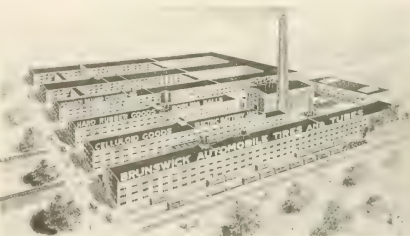
The B. F. Goodrich Co., Akron, Ohio, has recently re-opened its depot at Sacramento, California, located at 1129 Ninth street. George M. Gay has been appointed local manager.

The temporary store of the Goodrich company at Columbus, New Mexico, which has been operated as part of the depot at El Paso, Texas, is now maintained as a separate service station, Charles R. Serfass continuing in charge. The principal activity of this depot will be caring for government business incident to the military activity on the Mexican border.

THE BRUNSWICK COMPANY WILL MAKE TIRES.

The Brunswick-Balke-Collender Co., Chicago, Illinois, has greatly increased its rubber factory capacity and will enter the automobile field with a complete line of automobile rubber parts and accessories, from tires to the smallest rubber unit found on a car.

The accompanying illustration shows the newly erected addition to this company's factory at Muskegon, Michigan, where



the Brunswick Skid-Not tire and a new puncture self-healing tube are manufactured.

J. E. Duffield, formerly Western manager for the Thermoid Rubber Co. and more recently connected with the United States Rubber Co. interests, will be sales manager for the entire rubber goods and automobile accessories division.

TRUCKS MUST BE RUBBER-TIRED IN MONTREAL.

Complaining of the deterioration in the city's streets caused by truck wheels, Montreal, Canada, has passed a law compelling truck owners to provide the wheels of their vehicles with tires made of rubber, or of some other resilient material that will not injure the surface of the streets.

PERSONAL MENTION.

Samuel Norris, secretary of the United States Rubber Co., recently underwent an operation, from which attending physicians state recovery is a practically assured fact.

Edgar B. Davis, in charge of the Sumatra plantations of the United States Rubber Co., and H. Stuart Hotchkiss, vice-president of the General Rubber Co., recently left New York for the Sumatra district on a tour of inspection of the properties which, it is estimated, will consume about six weeks. They expect to return to New York early in November.

Arthur W. Stedman, manager of the crude rubber department of the Hagemeyer Trading Co., New York City, returned from an important and successful trip to England on July 20.

Grant Lambright, formerly superintendent of the Bucyrus Rubber Co., has recently assumed the management of the Marion Rubber Co. He is succeeded by John Field, formerly assistant superintendent of the Bucyrus plant.

D. P. Harris, head of the Harwaco Rubber Works, New York City, and of the D. P. Harris Hardware Co., returned from a trip to the Pacific Coast recently, and superintending the removal of these two concerns to their new building, corner of Church and Chambers streets.

William H. Wellington, of the commission house of Wellington, Sears & Co., has been elected a director of the Hamilton Woolen Co., to fill the vacancy caused by the death of Charles B. Gookin.

Maurice Horowich, of the Double Tread Tire Co., Binghamton, New York, has secured the agency of the Northland Rubber Co., of Buffalo, and will distribute Northland tires in Binghamton and vicinity.

B. C. Swinehart, for three and a half years manager of the Philadelphia branch of the Republic Rubber Co., has been called to the factory at Youngstown, Ohio, where he will have charge of the solid tire department. He is succeeded by H. S. Worthington, who has been connected with the Philadelphia branch for the past five years as assistant manager.

R. W. Pharis recently resigned as director and manager of the Columbus branch of the Pharis Tire and Rubber Co., Newark, Ohio, to assume the management of the International Tire Co., a distributing concern handling factory seconds, located at 187 Gay street, Columbus, Ohio.

E. P. Logan, formerly district manager of the St. Louis branch of the Federal Rubber Co., has recently assumed charge of the central district, with headquarters in Chicago, Illinois.

Edward C. Strayer, who has been the office credit man for the McGraw Tire & Rubber Co., East Palestine, Ohio, for the past two years, left for St. Louis, Missouri, during the past month, to take charge of the McGraw office there.

Fred H. Ayers, formerly New England district manager and for 13 years connected with the Fisk Rubber Co., Chicopee Falls, Massachusetts, has been appointed supervisor of districts, with charge of the entire outside organization of the company.

A. J. Pennington, formerly with the Dryden Rubber Co., Chicago, has been appointed general superintendent of the tire, tube and automobile accessories plant of the Brunswick-Balke-Collender Co., at Muskegon, Michigan.

J. L. Wacksmuth has been appointed local manager of the Washington depot of The B. F. Goodrich Co., Akron, Ohio.

B. F. Hochschild has resigned the office of treasurer and general manager of the Gordon Tire & Rubber Co., Canton, Ohio, and will announce later his new connection.

G. J. Bates, for the past ten years prominently identified with the tire business, has relinquished a prominent position with the Firestone Tire & Rubber Co. to accept the newly-created office of commercial manager of the King Motor Car Co., Detroit, Michigan.

G. F. Farasey, formerly with the Boston and Cleveland branches of the Kelly-Springfield Tire Co., has been made office manager of the local branch at St. Louis, Missouri.

I. B. Rohrer has been appointed general manager of the Fisk Rubber Co. branch at Council Bluffs, Iowa.

H. B. McMaster, general manager of branches of the Berger Manufacturing Co., Canton, Ohio, has resigned to become vice-president and general manager of the Gordon Tire & Rubber Co., of the same city.

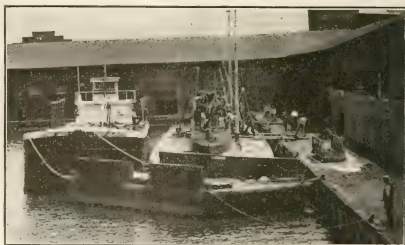
PREPAREDNESS PARADE AT MILWAUKEE.

Preparedness parades are in order all over the country, and in Milwaukee, Wisconsin, on July 15, the rubber trade was well represented in an enthusiastic gathering undaunted by the rainy weather. The Federal Rubber Co. representatives numbered 583, and each man and girl wore a white felt hat with a ribbon band on which the words, "Federal Rubber Co." were printed. The Cutler-Hammer Manufacturing Co., whose devices are so largely used in rubber factories, had 1,074 representatives in the parade. The following companies having branch stores in Milwaukee were also represented: Fisk Rubber Co., United States Rubber Co., Goodyear Tire & Rubber Co. The Wisconsin State Rubber Co. also had a file of representatives in the parade.

THE GERMAN SUBMARINE AND THE BRITISH BLACKLIST.

AN event of interest in the rubber trade, last month, was the arrival at Baltimore of the German submarine "Deutschland," and the taking on of a cargo to carry back to Germany. Great secrecy was maintained as to the character of this cargo, but that it comprises, in part, approximately 150 tons of Upriver fine rubber is a practical certainty.

It is considered quite probable that in the sale and shipment of this rubber some American rubber brokers and dealers were concerned. Soon after the arrival of the "Deutschland," and the



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LOADING RUBBER ON THE "DEUTSCHLAND" AT BALTIMORE.

reports of its intention to carry to Germany contraband materials, came the announcement by the British Government that over 80 firms, corporations or individuals in the United States had been placed on the "black list" under the "trading with the enemy act" which prohibits persons domiciled in the United Kingdom from dealing with these parties. Among these 80 houses are several connected with the crude rubber business and some of these feel that their business will be severely restricted if they cannot purchase rubber in any British home or colonial market, or secure transportation of goods from any port in British vessels.

RUBBER SCRAP DEALERS' PACKING STANDARD.

ACCORDING to a request, we publish in a slightly condensed form "Circular B" of the Rubber Scrap Division of the National Association of Waste Material Dealers.

All goods bought and sold under these specifications are understood to consist only of domestic manufacture unless otherwise stipulated. All rubber scrap bought and paid for net weight, no allowance for bagging nor covering of any kind, nor shall same be returned to seller.

DELIVERY.

- A. Delivery of more or less on the specified quantity up to 2½ per cent is permissible.
- B. If the term "about" is used, it is understood that 5 per cent more or less of the quantity may be delivered.
- C. In the event that buyer should claim the goods delivered on a contract are not up to the proper standard, and the seller claims that they are a proper delivery, the dispute shall be referred to the Arbitration Committee of the National Association of Waste Material Dealers to be appointed for that purpose.
- D. A contract for a carload, unless otherwise agreed upon, shall mean the minimum quantity recognized by the official classification tariff of the district in which the seller is located.
- E. A ton shall be understood to be 2,000 pounds unless otherwise specified.

The standard of packing is given below:

1. RUBBER BOOTS AND SHOES must be packed as per Rubber Reclaimer's Circular No. 5. (Circular No. 5 is the same as No. 3 excepting that red, white, tan and fancy colored shoes must be kept out.)
2. TRIMMED ARCTICS must be closely trimmed and free of leather, tennis soles, tennis shoes and detached heels.
3. TRIMMED TENNIS SHOES must be black; closely trimmed; free of molded soles, and leather.
4. STANDARD AUTO TIRES must be free of the following: All McGraw tires such as "Imperial," "Pullman" and "Congress" and other tires of similar quality; all unguaranteed tires; heavy beaded tires; "Dayton Airliners" and other filled tires; must not contain any hard, oxidized, burnt, single tube, motorcycle, stripped or badly worn tires nor tires containing leather or metal.
5. UNGUARANTEED TIRES must be free of heavy beaded tires, hard or oxidized, stripped, badly worn tires with leather and metal.
6. HEAVY BEADED TIRES must be free of hard or oxidized tires, stripped, badly worn and tires with leather and metal.
7. STRIPPED AND BADLY WORN TIRES must be free of hard or oxidized tires, heavy beaded and tires with leather and iron. A reasonable proportion of the tread must be on the tires.
8. NO. 1 AUTO TIRE PEELINGS must be free of cloth, metal and leather.
9. NO. 2 AUTO TIRE PEELINGS must consist of peelings from auto tire treads only and must be free of metal, leather and stripped auto tire fabric.
10. BICYCLE TIRES must be free of hard or oxidized tires, wire and beaded tires.
11. SOLID WAGON AND CAB TIRES must be free of metal and baby carriage tires.
12. SOLID MOTOR TRUCK TIRES must be free of metal and tires with hard bases and fiber bases.
13. AIRBRAKE HOSE must be free of metal, hard or oxidized hose and steam hose.
14. GARDEN HOSE must be free of metal, rags, rope and cotton covered hose.
15. LARGE HOSE must be free of metal, rags, rope, hard or oxidized hose and all cotton covered hose.
16. COTTON COVERED FIRE HOSE must be rubber lined, and free of hard or oxidized hose and metal.
17. NO. 1 AUTO INNER TUBES must be strictly elastic floating tubes, free of crusty tubes, cloth and metal.

18. NO. 2 AUTO INNER TUBES KNOWN AS COM-
POUNDED TUBES must be standard tubes, free of crusty tubes, cloth and metal.

19. NO. 1 BICYCLE INNER TUBES must be strictly elastic floating tubes, free of crusty tubes, cloth and metal.

20. NO. 2 BICYCLE INNER TUBES KNOWN AS COM-
POUNDED INNER TUBES must be standard tubes, free of crusty tubes, cloth and metal.

21. RED AUTO INNER TUBES must be standard tubes, not perforated, free of crusty tubes, cloth, metal and black patches.

22. NO. 1 WHITE RUBBER must consist of strictly clean white soft druggists' sundries and must be free of cloth and metal.

23. NO. 2 WHITE RUBBER must consist of white horse shoe pads, white toys, white mechanical goods, and to be free of cloth, metal, crusty, hard oxidized material.

24. NO. 3 WHITE RUBBER must consist of painted white rubber balls or toys and white jar rings, and to be free of cloth, painted wainscoting, metal and hard or oxidized rubber.

25. WHITE WRINGER RUBBER must be strictly white soft rubber, free of yellow wringer rubber, hard or oxidized wringer rubber, cloth and metal.

26. YELLOW WRINGER RUBBER must be free of cloth, metal and free of hard rubber.

27. MIXED BLACK RUBBER must be free of cloth, metal, crusty, hard or oxidized material, packing, stripped matting and tiling.

28. MATTING AND PACKING must be free of Garlock and piston packing, belting and similar material, metal and hard or oxidized stock.

29. NO. 1 RED RUBBER must consist of soft red druggists' sundries, free of maroon, chocolate, and other dark shades, also free of cloth and metal.

30. NO. 2 RED RUBBER must consist of material such as red toys, balls, mechanical red. Must be free of jar rings, soles, packing, hard or oxidized rubber cloth and metal.

31. RED PACKING must be free of hard or oxidized rubber, cloth and metal and discolored rubber.

This standard of packing was adopted by the Rubber Scrap Division and approved by the executive committee of the association on March 14, 1916, to be effective from April 1, 1916.

CHEMICAL INDUSTRIES EXHIBITION.

The second National Exposition of Chemical Industries will be held at Grand Central Palace, New York City, September 25-30, 1916. Many important manufacturing companies doing business with the industries wherein chemistry plays a part, will make exhibits. Several chemical and engineering societies will hold their annual meetings in that city during the week. The American Chemical Society, and the American Electrochemical Society are among the number.

The Bureau of Commercial Economics at Washington is co-operating with the exposition by arranging an elaborate program of motion pictures covering subjects dealing with the industries depending on chemistry. Many of these films will have their premier showing at the exposition. They will take the visitor through industrial plants, shops, manufactories, mines, etc., where visitors themselves are never admitted. They will show operations which in ordinary light would never be seen. They will demonstrate more than any other kind of motion pictures the great strides and improvement in the art of photography.

A few of the films that appear on the tentative program are: the rubber industry, the match industry, manufacture of explosives, varnish manufacture, silver mining, mining and manufacturing of iron, making of blotting paper, accident and fire prevention, manufacture and use of fertilizers and the manufacture of steel.

Some of these films are now being made, and other features are in active preparation for the exposition.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

THE Mason Tire & Rubber Co., at Kent, Ohio, is completing installation of equipment in its new factory and expects to start making tires within a few days. The plant is of steel and concrete construction, is 220 feet long and contains about 40,000 square feet of floor space, having a capacity of 500 tires and tubes per day. This structure stands in the middle of a 16-acre tract of land, thus affording ample room for expansion.

The officers of the company are: O. M. Mason, president; I. R. Davies, secretary; D. M. Mason, general manager, and A. S. Hetzel, sales manager. B. E. Frantz, superintendent, has



PLANT OF THE MASON TIRE & RUBBER CO., KENT, OHIO.

spent 12 years in practical tire making, having been connected with some of the largest Ohio plants; and H. H. Forrest, another practical tire man, is in charge of the tire and tube department.

It is stated that already plans are being made for increasing the capacity to 1,000 tires per day, these plans calling for the addition of a one-story mill and calender room of saw-tooth construction and three-story cutting, tire-building and storage rooms.

The company is capitalized for \$1,000,000, \$650,000 preferred and \$350,000 common stock, the financing of which has now been practically completed.

Since 1910-11, when the Firestone Tire & Rubber Co. moved into its new factory, the sales have grown from \$7,462,581.17 to \$25,187,884.33, making a total increase of 257 per cent for the past five years. This past year, 1915-16, the increase to June 1 was 38 per cent over the showing of 1914-15. Since the new factory was erected five years ago it has been tripled in size. This has been done, wing by wing, these additions being made without loss in production efficiency.

The annual picnic of the Firestone company was held on Saturday, July 29. In the morning special cars carried the Firestoneites and their families, numbering around 25,000, to Silver Lake Park, near Akron. A soccer football game and a baseball game between department heads were keenly enjoyed by both participants and spectators. Following bountiful midday refreshments, varied athletic events provided wholesome fun until time for the evening display of fireworks, which were shown on the island in the center of the lake.

At a meeting of directors of the Portage Rubber Co., on July 11, the capital stock of the company was increased from \$1,250,000 to \$3,000,000, \$1,500,000 of this increase to be issued and disposed of as common stock and \$250,000 as preferred stock.

The employees of the Miller Rubber Co. held their annual outing at Silver Lake Park on Saturday, July 15. The picnic was

largely attended and the day's sport proved highly enjoyable, a baseball game being the chief feature.

The books of The B. F. Goodrich Co. were closed on July 1, for the purpose of determining the result of operations for the first six months of 1916. They have not been audited by public accountants, but the company's auditor has submitted to the directors a statement of earnings for the period. After making proper provision for maintenance charges, depreciation, doubtful accounts, and all known outstanding current liabilities, the net profits for the period amounted to \$4,800,000.

The Goodrich company is the first among our rubber factories to adopt the weekly pay system for its employees. Heretofore the workers have been paid semi-monthly, and under that system new workmen had to wait three weeks before drawing any money, as the first pay was held back. This meant hardship in many cases, especially among out-of-town workers who arrived in Akron with only a small amount of money.

The Goodrich and Goodyear companies gave \$15,000 each to the recent campaign for Akron hospitals. A. H. Marks, vice-president of the Goodrich company, donated \$25,000, and C. B. Raymond, secretary of the same company, gave \$10,000. F. A. Seiberling, president of the Goodyear Tire & Rubber Co., also gave \$10,000.

The factory school of the Goodyear Tire & Rubber Co., organized originally for the benefit of the workers in several departments, has been so successful that the classes are now thrown



GOODYEAR EMPLOYEES NOW AT THE FRONT.

open to all employees of the company. Those wishing to improve upon their early education can do so, by means of these classes, in common school and high school subjects, arranged at convenient hours; while in the citizenship classes, men of alien birth are taught the fundamental principles of our government, the geography of the country, and the subjects necessary to make them intelligent citizens.

Lucian L. King, advertising manager for the Goodyear Tire & Rubber Co., Akron, Ohio, who is a member of the Hospital Corps of Battery "B," Ohio Field Artillery, has been detailed to special duty in inaugurating a publicity campaign to stimulate enlistment in the National Guard.

The capital stock of the Punctureless Auto Tire Co., at Bartenton, Ohio, has been increased from \$100,000 to \$1,000,000.

The Phoenix Rubber Co. is the name of a newly organized concern to locate in East Akron. The company will make molded specialties.

The rubber men who attended the outing of The Rubber Club

of America, Inc., on July 18, were greatly pleased at the smoothness of the arrangements whereby they were transported to and from Akron in the special cars under the direction of Messrs. H. S. Firestone, W. O. Rutherford and C. B. Raymond. Akron was represented by nearly 40 members of the trade and probably had a larger showing than any city except New York and Boston. They were handsomely entertained by members of the Boston trade during their visit to that city.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

AN event of interest in the trade was the Shoe and Leather Market-Fair which was held in the Mechanics' building the second week of last month. Taken as a whole, it was much less a shoe fair than a leather fair, for there were few shoe exhibits. There were, however, quite a number of rubber manufacturers who had exhibits, most of these showing heels and soles. The number of people manufacturing these is evidence of the increasing use of rubber or compositions containing rubber, to replace leather in footwear. This is, of course, largely due to the excessively high cost of leather, but it is also, in a measure, due to the growth of appreciation of rubber for this purpose by the public.

Among those who exhibited at the fair was the Foster Rubber Co., which for many years has manufactured the "Cat's Paw" heels and is the manufacturer of rubber soles. This exhibit was in charge of William Noll, the enterprising sales manager of the concern, who made a good showing of the many shapes and styles of heels and soles made by this concern, the samples being arranged on the hinged leaves of a huge book. An amusing animated sign, advertising the "Cat's Paw" heel, showed the black cat trade-mark of the company, which by mechanical action humped its back and lifted its paw at regular and frequent intervals. A good display was also made of the "Red Plug Spring Step" heel which this company is now handling for the jobbing trade.

The Essex Rubber Co., Trenton, New Jersey, had a fine display of its rubber fiber and fiberized soles and heels. The booth was attractively arranged. Large artistic pictures were shown at the back, labeled "Business," "Pleasure," "Safety," "Service," showing, respectively, the business man, with a city background, a yacht at full sail, a policeman at a street corner, and a girl tripping along gaily in the rain.

The exhibit of the Plymouth Rubber Co., Canton, Massachusetts, was in charge of W. H. Mott. Its advertised line of "Slipknot" rubber heels was featured by means of a big gilt sign in the shape of a heel, and properly lettered. The company showed a line of plain plug heels for manufacturers to use on their shoes; also soling and patches for cobblers' use, a line of rubber boot heels and a line of "Durable Kompo" fiber, and rubber soles and "Bantam" soles of rubber and fiber. A novelty was shown in a shoe in which not a particle of leather was used. The top was of shoe cloth, the vamp of "Plymouth Leatherette," the sole of "Durable Kompo," with "Slipknot" heel and inner sole of "Gem" duck—everything, except the counter, the product of the Plymouth Rubber Co.'s factory.

The Avon Sole Co., Avon, Massachusetts, which claims to be the pioneer in making a shoe sole of leather fiber and rubber combined, had a display of its "Du-Flex" sole and "Avon" fiber sole, both being guaranteed to outwear the best oak sole leather. This company claims to use only the best plantation rubber in its compounds, and exhibited samples of first latex and smoked sheet rubber. The exhibit was in charge of C. B. Packard.

The I. T. S. Rubber Co., Elyria, Ohio, exhibited a novel style of rubber heel, it being molded convex on the tread and concave on the part attached to the heel, this shape being adopted that the heel might lie flat and close, with a tight joint, even

without cementing, when attached. The claim for this heel is that because of this shape the nails can be placed nearer the center, and therefore the heel will stand more wear before the heads of the nails are exposed, thus giving longer wear and less liability of damage to floors. This company also showed a novel way of packing heels, the carton being so labeled that whatever side is presented to view on the shelf, the contents of the carton can be easily and quickly read, the boxes being square, the sizes marked on all four sides, right side up and up side down, and the exact pattern of the heel shown on both top and bottom. This exhibit was in charge of J. G. Tufford, the inventor of this heel.

The B & R Rubber Co., North Brookfield, Massachusetts, had an exhibit of its "Armortred" rubber soles, in white, gray and tan. The company claims these soles to be 25 to 50 per cent lighter than the average rubber sole. The "Barco" brand was also exhibited, a lower-priced rubber sole made expressly for shoe manufacturers, who, if they so desire, can have their names placed upon the sole.

The Oko Rubber Co., Campello, Massachusetts, exhibited a series of samples showing the gradual changes from the pure rubber sole to the fiber sole it is now manufacturing, and which is made of cotton felt with only 5 to 8 per cent of rubber as a binder. It is claimed that this sole is neither a rubber nor a leather sole, but that it will outwear either, will not crack or break, and is absolutely waterproof. The exhibit was one which was viewed with interest by many because of this practical demonstration.

The Fellsway Rubber Co., Medford, Massachusetts, exhibited its "Walkmore" soles and heels, manufactured expressly for the findings trade. These soles are made of flax and cotton fiber combined with rubber and are claimed to outwear leather, can be stitched without breaking, and are claimed to be superior to either rubber or leather soles. The "Walkmore" heels, unlike many other heels exhibited, also contain fiber.

Perhaps the handsomest booth at the fair was that of The B. F. Goodrich Co., Akron, Ohio, which was effectively decorated so that it seemed a veritable flower garden. M. M. Davis had charge of this exhibit, in which there was a fine display of the Goodrich company's "Textan" soles, which were pronounced to



EXHIBIT OF THE B. F. GOODRICH CO. AT THE SHOE AND LEATHER MARKET-FAIR.

be of fiber and rubber, just enough rubber being used for a binder. This sole is being exploited by means of extensive advertising and is being adopted by many shoe manufacturers on certain lines of their goods. A number of handsome shoes were exhibited with "Textan" soles. This company also exhibited the O'Sullivan rubber heels which, although not marketed, are manufactured by the Goodrich company. Incidentally, it was stated to your correspondent that the company recently made one shipment of 30 tons of O'Sullivan rubber heels.

The Federal Rubber Co. of Illinois, Cudahy, Wisconsin, exhibited a line of "Pennant" fiber soles and "Pennant" fiber and rubber heels for shoe manufacturers and "Rugged" fiber soles and heels for the jobbing trade.

In the booth of the Panther Rubber Co., of Stoughton, Massachusetts, was a striking representation of its trade-mark, being an immense, stuffed panther. Among the heels which were shown were the "Triplug," "Panther Tread" and "Indian" brands. The "Indian" and "B. B." soles were also shown, the "Indian" sole being guaranteed to such an extent that if a sole goes wrong the company pays for the whole shoe, while with the "B. B." soles, if any trouble results, the company pays for the sole. The Panther company also showed a line of coated duck for making "Gem" inner soles, and exhibited a heater which it furnishes to customers for use in manufacturing these inner soles from the Panther company's mill. This concern distributed advertising fans which were very popular during the heated term which lasted all through the week of the exhibit.

The Goodyear Tire & Rubber Co., Akron, Ohio, had a very extensive exhibit of shoes made by prominent manufacturers, with the Goodyear "Neolin" soles attached; also a line of "Wing-foot" heels. This company distributed diminutive sample soles of "Neolin."

The Hood Rubber Co., Watertown, Massachusetts, was the only concern to exhibit rubber footwear on this occasion. The booth was in charge of William B. Loughton, manager of the Hood company's export department. The exhibit consisted of a large variety of rubber and tennis footwear, the regular line manufactured by the company, and there were samples of Para biscuit and plantation rubber. This booth was a center of attraction when Mr. Loughton distributed little silver-plated charms in the shape of Hood rubber boots and storm slippers.

At the United States Rubber Co.'s booth, in charge of F. T. Ryder, was a fine exhibit of this company's new "Rinex" sole, in black, white and tan. This sole is made at the Revere Rubber Co. factory at Chelsea, Massachusetts. At this exhibit a large number of diminutive pin badges in the shape of flags, containing the United States company's trade-mark, were distributed and many hundreds of these were given away, thus popularizing still further the trade-mark of the company.

In the same booth were exhibited the various specialties of the Revere Rubber Co.'s shoe supply department, which is the successor to the Walpole Shoe Supply Co., this portion of the exhibit being in charge of J. N. Moulton.

Although the concern known for years as the Hub Gore Makers is now a part of Everlastik, Inc., New York City, still, as far as the shoe trade is concerned, the old name is used, thus preserving the identity and the words on which thousands of dollars have been spent in advertising. This concern exhibited a large number of styles of footwear in which elastic goring was used, some novel forms being shown. The one most noticeable was a new automatic shoe which was worn by a lady demonstrator who exhibited its workings to all interested visitors. This shoe has a lattice of little wires on either side of the opening of the shoe. A sliding key is pulled up and the lattice is interlocked. When pulled down it is unlocked. It is evident that such a shoe would not be satisfactory unless it fitted perfectly, and to insure a proper fit, for large or small ankles, an insertion of elastic goring is used. There were shoes shown having the entire top of Everlastik cloth, and pumps in which some webbing was used; also, the "Gardiner No-Wrinkle" turned shoe, which has a piece of goring in the lining of the heel, thus enabling the shoe to be turned without breaking or wrinkling.

The Peters Manufacturing Co., of New York and Boston, which does a business in backing cloth and thin leather by means of gutta percha cement, showed various samples of its work in this line and demonstrated the advantages of its methods by means of a testing machine showing the number of pounds pres-

sure necessary in order to burst a hole in these various backed leathers and fabrics.

The American Wringer Co., Woonsocket, Rhode Island, exhibits a full line of its rubber-covered rolls and bolsters for tanning machinery.

The Dexter Manufacturing Co., of this city, exhibited a line of rubber cements for shoe manufacturers.

The Fibre Hide Filler Co. exhibited a filler of ground cork and rubber cement for sole filling; also a machine for demonstrating the manner of use of the filler.

Taken altogether, it will be seen that this was quite a rubber fair, as well as a leather fair. The attendance was large, and it is stated that a large amount of business was accomplished with visiting shoe manufacturers.

The Boston Woven Hose & Rubber Co., Cambridge, had a special exhibit at the annual convention of the National Retail Hardware Association, held at Mechanics' Hall a month or two ago. Specimens of crude Para and plantation rubbers were shown, as were also finished sections of the various lines of



EXHIBIT OF THE BOSTON HOSE & RUBBER CO. AT THE HARDWARE CONVENTION.

hose this company manufactures, and samples of its fruit jar rings and spray nozzles. In connection with the convention, the company's motion picture film, "The Story of Rubber; What It Is and What It Does," was shown, thus affording dealers an opportunity to see how the products exhibited were manufactured.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE rubber factories in Rhode Island continue to be rushed with work as they never have been before, while orders continue to pile up in a manner that indicates full time schedules for months to come. Rubber goods of every description are wanted, and the factories are shipping large consignments of their products daily. Additions and improvements are being made to the factory, machinery and equipments. The prevailing scarcity of help has for many months proved a severe handicap to manufacturers.

The movement started by friends of the late LeBaron Carleton Colt to secure funds for the purchase and equipment of a memorial ambulance, is meeting with considerable success, and it is expected that the desired amount will soon be in hand. It was at first proposed to found a free bed in memory of Mr. Colt at the Rhode Island Hospital in Providence, but the committee decided that the ambulance would serve the people of the town

of Bristol to better advantage, and arrangements were accordingly made to receive contributions, especially from among the officers and employees of the National India Rubber Co.

The ambulance, which will cost about \$5,000, will be housed at the National Rubber company's plant, in readiness to respond to call, whenever needed. The executive committee having the matter in charge consists of James W. Franklin, chairman; Edward E. Bunn, secretary; Wendell R. Davis, treasurer; Arthur H. Emerson, Robert W. S. Cox and Frederick L. Dunbar.

The F. O. B. Club, composed of employees of the Revere Rubber Co., Providence, held an outing and field day at Emery Park on July 1, the affair being a great success. The program consisted of a chicken dinner and outdoor sports, including a baseball game between the married and the single men, which was won by the Benedicts, by a score of 12 to 4. There were 65 in the party.

The practical side of modern efficiency was demonstrated at the Alice mill of the Woonsocket Rubber Co., and later at the Millville plant of the same concern, during the past month, where a dozen of the traveling representatives from the branch stores of the United States Rubber Co. were engaged in learning the rudiments of the rubber business. The salesmen came from Chicago, New York City, Baltimore, Buffalo and Boston, and spent several weeks in learning how rubber shoes, arctics and boots are made.

Early in the past month the property in Bristol, originally occupied by the Byfield Rubber Co., and later by the Consumers' Rubber Co., was transferred to the Narragansett Rubber Co., of which Terrence McCarthy holds the controlling interest. The transfer was consummated through the receiver in charge of the settling of the affairs of the Consumers' company, which became involved in bankruptcy proceedings following the suspension of the Atlantic National Bank of Providence some three years ago.

Mr. McCarthy reports that the business of the Narragansett Rubber Co. is constantly on the increase, the demand, being especially large for tennis shoes. A large quantity of these are being shipped every day to customers of the concern in the West and Southwest.

The International Rubber Co. is making extensive alterations, additions and improvements at its plant at West Barrington, among the most important being the erection of new buildings for the enlargement of the carriage cloth department, the demands upon which have increased many-fold within the past year. One large new wooden building has just been completed and is being equipped, and other buildings are to be erected at an early date.

The Goodyear Tire & Rubber Co. has taken the store at Federal and Tower streets for salesrooms. There is a big rear section for a shipping and delivery room, while the cellars have storage capacity for 6,000 tires.

Notices were posted during the month at the factory of the National India Rubber Co., Bristol, for a shutdown of the plant for twelve days for the purpose of a general stock-taking, in accordance with orders from the managing director, George Schlosser. The last day of making will be Tuesday, August 22, and the factory will resume operations for the first day of making on Wednesday, September 2.

The BeSaw Tire Co., 46 Franklin street, Providence, is being conducted by Frederick L. Scott, of 316 Pawtucket avenue, Pawtucket, and Adolf W. Schaick, of 257 Broadway, Providence,

according to their statement filed at the City Clerk's office.

C. Schoos & Son have recently installed a complete vulcanizing equipment in their place of business, Quindnick street, Arctic, for all kinds of work on tires, inner tubes, etc.

William McCaw, assistant treasurer of the Lee Tire and Rubber Co., Conshohocken, Pennsylvania, formerly a resident of Bristol, spent several days the early part of the month at his old home.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

MANUFACTURERS of rubber machinery continue to be handicapped by a scarcity of workmen. The molders have been on a strike for several months, and the end of the trouble is not in sight. The machine plants are all running with reduced forces, whereas they have sufficient business to keep a much larger number of operatives busy. It is necessary to have a detail of special police escort the "open shop" workers to and from their homes. This is a particularly unfortunate condition, coming as it does at a time when orders are so plentiful.

The DeLion Tire & Rubber Co. has completely recovered from the effects of its recent fire. The plant has been rebuilt, in larger dimensions than the original structure.

The Essex Rubber Co. has awarded cash premiums to those of its employees who took advantage of the concern's educational inducement feature, by attending night schools during the last term. The attendance for October, the largest month, was 18. Of these, 13 took the English course. More than one hundred dollars was expended by the concern in making the awards. It is thought that a larger number of employees will take advantage of the plan next season. Most of last season was devoted to getting the work under way. It is figured by the company that any employee who is willing to devote his evenings to study will most likely prove a more efficient operative because of the more intelligent use of his time. The offer of the company was not made in a narrow spirit, for it rewards its employees even though they take up technical work entirely foreign to the rubber trade.

The Essex company recently gave United States flags to 350 employees for the purpose of stimulating patriotism.

The Lambertville Rubber Co. will begin operations shortly on the erection of an addition to the plant, to cost several thousand dollars. Plans have been drawn, and when the work is started it will be pushed to completion to help take care of the coming season's business. This company has had an unusually successful season. An entirely new line may be added to the company's output following the completion of the new building. The nature of the new line will shortly be announced.

The employees of the United & Globe Rubber Manufacturing Cos. have formed an organization known as the U. & G. Athletic Association; having for its object the furtherance and promotion of various sports.

A constitution and set of by-laws have been adopted and the following officers elected: John S. Broughton, honorary president; George W. Skirm, president; Daniel M. Henry, vice-president; Joseph D. Connelly, secretary and treasurer.

The association has secured a room at the Central Y. M. C. A. in which to hold their regular meetings once a month.

RUBBER TIRES LEND THEMSELVES TO A SCHEME OF DECORATION in a Little Rock, Arkansas, drug store, where the proprietor has dressed his soda fountain with tires, headlights and steering wheel. He claims that it attracts business, not only from automobilists but also from others.

The India Rubber Trade In Great Britain.

By Our Regular Correspondent.

JUDGMENT has now been delivered by the House of Lords (the unusual number of eight law lords sitting) in the action of the Daimler Co., Limited vs. the Continental Tire and Rubber Co. (Great Britain), Limited, in favor of the plaintiff company. The Continental company brought an action to recover a debt for tires supplied to the Daimler company, which refused to pay on the ground that the Continental company was an enemy firm. Both the Court of First Instance and the Court of Appeal decided in favor of the Continental company, because it was registered in England, although 24,999 of its 25,000 shares were held by subjects of the German Empire, who reside in Germany. The final Court of Appeal has now upset this decision and decided that the Continental company cannot sue the Daimler for the money due during the period of the war. This decision is of considerable importance as it has been taken as a test action with regard to numerous other companies of the status of the Continental.

CHANGED TAX REGULATIONS.

The extra tax proposed in the last budget on private motor cars has been abandoned, and an additional tax of 6d. per gallon on petrol substituted for it. Further, there are special regulations relating to the purchase of petrol by car owners, all of which have the object of still further reducing the use of motor cars for pleasure. Commercial motor vehicles and parts thereof have now been put on the list of prohibited imports.

TRADE DISPUTE SETTLED.

The long drawn-out dispute at the Premier Rubber Works, Manchester, has now been amicably settled, a standard price list having been arranged between the Waterproof Garment Manufacturers' Section of the India Rubber Manufacturers' Association and the United Garment Workers' Trade Union.

ROYAL AGRICULTURAL SOCIETY EXHIBITION.

This year's show was held at Manchester at the end of June and proved a great success, both as regards exhibits and attendance. With respect to rubber there is not much to report, as owing to the embargo put upon the exhibition of tires of any sort by the Ministry of Munitions, many rubber manufacturers who would otherwise have had a general display did not exhibit. The only manufacturer who had a stand was the North British Rubber Co., Edinburgh, which made a comprehensive exhibit of hose used for various purposes connected with agriculture, also driving belts for machinery. A few waterproof garments were also on view, but here the firms dealing with the wholesale trade only, did not attempt to rival the exhibits of the retail firms, such as the Palatine Rubber Co., of Manchester; J. H. Peck & Co., of Wigan; Davis & Co., of Oxford, who had exhibited collections of waterproofs, rainproofs and oilskins. Exhibitors of this sort are about the only people who smile when the weather breaks after a bright morning, as they make a large number of sales among those who have come unprovided. James Wilson & Co., of Manchester, had a good display of waterproof covers of every description, carriage rugs and oilskins, here as elsewhere, being much to the fore.

Some buildings were roofed with Ruberoid, which is a British invention of earlier date than its rival, the asbestos slate. The name and plasticity of Ruberoid might lead to the supposition that it contained rubber. This, however, the makers, the Ruberoid Co., Limited, Brimedown, Middlesex, expressly disavow, stating that it is a special form of bitumen and felt.

The mechanical milking apparatus, which is by no means novel, attracted a good deal of attention this year, owing to the

scarcity of farm labor. A considerable amount of white and red one-inch and half-inch rubber tubing is required for the equipment.

THE CHEMICAL OUTLOOK.

The recent break in the high prices which have ruled for some time in the case of many chemicals, and more especially metals, is welcome to those who are not contracted far ahead. This break is attributed, rightly or wrongly, in many cases, to increased production in America, where factories have been rushed up regardless of cost. Of course, the fall in the market quotations for zinc and lead is not immediately reflected on compounds like zinc oxide and litharge, but buyers who will be in the market shortly are expecting better terms than they obtained a few months ago. Solvent naphtha has slumped considerably from the contract prices of six months ago. It is noticeable that some of the chemicals which have been coming to us from across the Atlantic are now being bought at much more favorable prices than six months ago, while others, notably carbon black, maintain their inflated price level. One result of the war will be a coordination and more general working together of our chemical manufacturers than has been the case in the past, when each firm kept its doings to itself. A powerful chemical manufacturers' association has been formed, including most branches of the chemical industry, and this association will be in a position to present its views forcibly to the government of the day.

According to statistics, America has increased her output of barytes to a much greater degree than we have since German supplies fell off. Before the war we produced about 50,000 tons per annum and imported about an equal amount from Germany. The imports had developed, not only because of the finer grinding and other preparative machinery, but because the German deposits generally are of more uniform purity. Our deposits are in many cases of somewhat variable constitution, other earthy minerals being apt to intrude, and lower the grade, thus leading to increased cost of production.

FOUNDER OF THE INDIA RUBBER JOURNAL.

Mr. Herbert Standing, who has been known to the rubber trade for more years than perhaps he cares to remember, and who has, since the war broke out, been connected with the mechanical transport section of the Army Service Corps, has now returned to business life as the representative of Messrs. Laughton & Sons, of Manchester, for London and the southern counties. This firm, which deals in reclaimed rubbers and substitutes, is the one which I recently reported to have taken over the Holt Town Rubber Co., Manchester, formerly belonging to the late Mr. Openshaw.

TRANSPORTATION OF RECLAIMED RUBBER.

Although in the great bulk of cases the regulations for the carriage of various commodities by railway are very much the same in Great Britain and America, there are some notable exceptions. Reclaimed rubber, for instance, is evidently considered as more dangerous in America than it is in England. The following is the American regulation for rubber shoddy, regenerated or reclaimed rubber. It must be packed in tight metal containers or in wooden boxes, complying with shipping container specification No. 17, except when in the form of dense homogeneous non-porous sheets or rolls, the sheets of thickness of $\frac{3}{8}$ inch or greater, packed flat or in rolls.

Rubber scrap, if ground, powdered or granulated, whose rubber content exceeds 45 per cent as determined by subtracting the sum of the per cent ash and the per cent acetone extraction from

100, must be packed in tight metal containers or in wooden boxes, complying with specification No. 17.*

The British railway regulations do not put reclaimed rubber on the special list of dangerous goods, though it is stated that india rubber and india rubber substitute, shredded or finely divided, must be packed in approved tarpaulin bags or in air-tight and damp-proof casks or cases.

The difficulties put in the way of carrying reclaimed rubber by some of our shipping firms have arisen from existence of the American railway rules, as nothing seems to be known in railway and shipping circles in Britain about any latent dangers attaching to reclaimed rubber. I don't say that the American rules are needlessly stringent, or that there is no cause for alterations to be made in Britain. I merely wish to draw attention to the difference in existing regulations. As reclaimed rubbers are by no means of uniform composition, and are prepared in different ways, it would seem that as regards liability to spontaneous combustion they should be sub-classified and not all lumped together under one general heading.

EXPORT PERMITS AND RUBBER PRICES.

A Far Eastern contemporary has published an extract from a letter from a leading firm in London in which the recent fall in crude rubber prices in the London market was attributed to the great difficulty in obtaining permits to export.

It seems that a certain individual or firm put in an application for permits to export large quantities of crude rubber to America, and succeeded in obtaining them, whereas at the time they were not in possession of any rubber or orders for rubber. It appears that after having obtained these permits they placed themselves in communication with various large American buying houses, soliciting orders, pointing out that possessing these permits, they were able to make more prompt shipments than other concerns could effect after receiving orders. Other buyers for the American market learning of this, promptly brought the matter to the notice of the authorities with the result that a number of additional restrictions and further difficulties soon attended the obtaining of permits involving very considerable delays. The writer of this letter says that it would appear that the authorities had gone from one extremity to the other and that representations had been made to the authorities, which it was hoped would result in an improvement in this matter.

THE RUBBER TRADE IN HOLLAND DURING 1915.

UNITED STATES CONSUL FRANK W. MAHIN, Amsterdam, Holland, reports that the rubber market in Amsterdam would have been at a complete standstill in 1915, had it not been for the efforts of the Netherlands Overseas Trust to induce the Entente Allies to permit the shipment of rubber into the Netherlands, for the use of the domestic industry, which required larger quantities than before the outbreak of the war, and which is steadily expanding.

The monthly public auctions at which Dutch East Indies rubber was formerly sold at Amsterdam have been discontinued since August, 1914, when the Batavia rubber market practically took their place. The exports of rubber from Amsterdam to the United States decreased from \$534,805 in 1914 to \$98,960 in 1915.

No reliable data are available regarding the actual stock of crude rubber on hand at Amsterdam at the beginning of 1915, nor is there any information that can be furnished regarding imports and prices obtained. Brokers state that

prices were higher than at the London market and were irregular. It is said that the highest price during the year for prime *Hevea* rubber, which was the quality most in demand, was about \$1.04 per half kilogram (1.1 pounds), and the lowest about 70 cents.

THE RUBBER TRADE IN GERMANY.

By Our Regular Correspondent.

CONDITIONS do not improve, but our enemies must not for a moment imagine that our position is hopeless. So great naval victory that was a serious blow to Britain's sea power, should open their eyes.

Official statistics, reports by chambers of commerce and other commercial and industrial organizations, as well as many trade manufacturing and local publications having ceased to circulate, all information concerning trade, commerce and general conditions in the different parts of the Empire is fragmentary and you must, therefore, pardon the desultory information and the unconnected style of the letters I may be fortunate enough to get through to you.

RAW MATERIALS.

Our rubber industry continues to suffer from the lack of raw materials, especially crude rubber, but it manages nevertheless to meet practically all demands by using compounds of reclaimed and synthetic rubber with small proportions of crude rubber.

Other compounding ingredients are not lacking, but their prices are very high.

Ducks and other fabrics used in the rubber industry are also very expensive and their use greatly restricted by governmental decrees.

Chemicals used in reclaiming are scarce and very costly, and their use is strictly regulated and supervised.

SYNTHETIC RUBBER A SUCCESS.

The manufacture of synthetic rubber has been placed on a basis that is commercial under the existing conditions. Many experts go so far as to predict that, before the end of the war, we will have made such progress that we will be able to produce this material, when peace is reestablished, in competition with the natural product and at such prices as to displace crude rubber partially, if not entirely. They predict for the rubber plantation, as well as for the wild rubber industry, the same fate as that which befell the indigo industry, not many years ago, when synthetic indigo was first brought out by Germans and in a short time completely destroyed the trade in the natural East Indian product. Of course this may seem very optimistic to you, but it cannot be denied that wonders have been accomplished by our chemists and by those who have helped them in making their discoveries industrially practicable.

TIRES.

Our armies continue to use rubber tires in ever increasing quantities and these are all being made of compounds containing synthetic, reclaimed and crude rubber, the latter in much restricted proportions.

Much has been done since the outbreak of the war, and especially in the last six months, to facilitate the use of steel-tired motor road vehicles in private enterprise. New speed limits have been fixed for these steel-tired vehicles; motor trucks and trailers, not weighing more than five and a half metric tons, empty, are now allowed to travel at as high as 15 kilometers (9.32 miles) per hour in open country and 8 kilometers (4.97 miles) per hour in towns. Only one trailer may be hauled by a steel-tired motor truck, and the speed in that case must not exceed 12 kilometers (7.46 miles) and 8 kilometers (4.97 miles) per hour in country and town districts, respectively.

These rules permit the extension of the private use of motor trucks that had been practically stopped by the restrictions in

*While our correspondent is correct as regards our railroad regulations for scrap and reclaimed rubber, the fact remains that little or no reclaimed rubber is shipped except in sheets or rolls, and scrap rubber seldom in powdered form.

the use of rubber tires, but regulations cannot relieve the machinery of these vehicles of the heavy strain and vibration caused by rigid tires at such speeds, and it is not likely that there will be any permanent developments in steel-tired motor vehicles for road use. Steel tires must do the work under present conditions, but after the war, when conditions again become normal, the great majority of users will go back to resilient rubber tires which insure economic operation such as can never result from the use of rigid tires.

TRADE.

The demands of the army and navy are so large that most of our rubber manufacturers, as well as manufacturers in many other lines, do not have time to worry about the civilian, foreign and domestic, trade that has been lost through the effect of the war.

FOREIGN TRADE.

Our foreign trade with neutral countries has become more and more limited, as a result of embargo, blockade, and contraband restrictions. Our trade with nations at war with us is naturally at a standstill since the beginning of the war. The success of our submarine merchantmen in landing dyestuffs in your country, however, has given us renewed confidence in overcoming these handicaps.

SHIPBUILDING.

Shipbuilding has been very active for the last year and is consuming much mechanical rubber goods, though practically all in substitute qualities.

MANUFACTURING.

The building trade continues to be stagnant and manufacturing industries that are not working for the war departments have very little to do.

AGRICULTURE.

Agriculture was never so important to us as it is today. The fact of the matter is, we feel that our salvation is to be found in our agriculture as much as in our arms. The shortage of food is acute in many sections of our country, but the coming crops promise to be plentiful and there are no immediate reasons to be over-anxious regarding the future.

LABOR CONDITIONS.

Labor conditions have now settled down to something like the normal. Female labor is largely taking care of lines of manufacture where male labor was formerly employed. Many industries have imported foreign neutral labor, mostly from Scandinavia and the Netherlands, and more than half a million prisoners of war are being employed.

The employment of prisoners has in fact largely limited the trade our manufacturers of machinery and rubber mechanical goods expected to do with the farmers; there being no real shortage of cheap labor, our agriculturists have not taken so readily to modern machinery as one could have expected them to. To be sure, more machinery is now used in our agriculture than formerly, but this is perhaps more due to the intensive development and the phenomenal growth of this industry since the outbreak of the war than to any other causes, shortage of labor included.

ORGANIZING FOR AFTER THE WAR.

Our leading industries are all seriously preparing for the commercial and industrial struggle that is sure to follow this war of blood.

Up to date nothing definite has been developed in our rubber industry, but our chemical manufacturers have formed a gigantic syndicate. This combine, which is for a period of 50 years, has for its object the safeguarding of the world-wide pre-eminence of our chemical industry. It will also enable its members to more easily bear their losses in foreign countries, which are estimated already at much more than \$25,000,000.

The new chemical combine has a larger capital than any other of our numerous syndicates or "kartels." Sums varying between \$50,000,000 and \$100,000,000 have been mentioned as constituting this capital. The following firms constitute this chemical combine: Badische Anilin und Soda Fabrik; Leopold Casella; Chemische Fabriken Weiler-ter-Meer; Kalle & Cie; Farbwerke Höchst; Farben Fabriken Bayer; and Aktiengesellschaft für Anilin-Fabrikation.

SECRET PATENTS.

Until a few years ago the Imperial Government recognized what was known as secret patents, claims and specifications of inventions which were filed with the patent department, but not published, yet protected the inventors' rights. The growing of liberal business interests, however, in time disposed of this rather undemocratic institution. But now all are beginning to recognize the advantages of this discarded system, which will probably soon be reestablished.

The keen commercial competition that is sure to follow the war makes necessary the protection of our national industries, and secret patents are well designed for this purpose. The compositions of the products we will place on the world markets after the war can well be determined by analyses, but these will be of little value as long as processes of manufacture can be kept totally secret.

LIMITATIONS ON RUBBER WASTE TRADE.

The Imperial Government has given to the following concerns the exclusive right to deal in rubber waste: H. Herzheimer, Florsheim; Martin Jacobsen, Berlin; F. H. Mayer & Co., Lubeck; Friedrich Walther Müller, Dresden; Eugen Perle, Breslau; Gebrüder Salomon, Hanover, and S. Salomon, Minden.

THE RUBBER TRADE IN JAPAN.

By Our Regular Correspondent.

ON account of greatly advanced cost of many compounding ingredients, 24 Japanese rubber manufacturers in Osaka, Kobe and other towns consulted together and advanced the prices of their manufactures 20 per cent, this advance to take effect the 1st of February. Tokyo manufacturers did not confer as an association, but each manufacturer raised his prices from 10 to 30 per cent because of these same reasons.

EXPORTS TO GREAT BRITAIN SMALLER.

Japanese manufacturers have received orders from Australia, British India, Straits Settlements, China, England, Russia and the United States. Among the goods which have been exported are tires, air pillows, rubber toys, shoe-heels, clothing, etc. Because of the British prohibition regarding rubber toys, Japanese exports of this line declined some 20 per cent from the previous year. In the matter of tires Japan sent to Great Britain last year, tires to the value of 513,518 yen [\$256,759], and the first four months of this year 310,000 yen [\$155,000], since which time none have been sent to Great Britain. These rubber tires were mostly manufactured for the military service, by the Dunlop Rubber Co., Limited, Kobe, Far East, which is a branch of the Dunlop Rubber Co., London. At the same time exports of valves for bicycles, motor cars and air bags which had been largely exported to England were also discontinued, and to further complicate matters, Great Britain placed export duties for export of iron and its manufactures, so that rubber machinery cost so much as to prohibit Japanese manufacturers from purchasing.

CHANGES AND ENLARGEMENTS.

Notwithstanding these untoward conditions, considerable enlargements have been made in Japanese rubber factories. The Azuma Rubber Works (Tokyo), burned last winter, was rebuilt on a new and larger scale in March. It manufactures rubber toy balls, rubber soles and heels. The Teikoku Rubber Co., Limited

(Tokyo), which was in financial difficulties last year, has been reestablished by new members, to manufacture "tabi" or "zori" soles.

The Tadetei Rubber Co. (Tokyo) increased its capital to 30,000 yen [\$15,000] in January. The Eastern Rubber Works (Tokyo) changed its capital to 15,000 yen [\$7,500] in March, and the Fujikura Rubber Cloth Works (Tokyo) increased its capital to 200,000 yen [\$100,000] in May, this amount being invested by Kenzo Okada and T. Matsumoto, leading members of the Fujikura Electric Wire & Rubber Co., Limited (Tokyo). The Cotton Belting Co., Limited, was established at Suma, Hyogo-Ken with a capital of 25,000 yen [\$12,500] to manufacture cotton beltings and rubber goods, and the Nitto Rubber Co. was established in Nagoya for manufacturing rubber tires for bicycles, and is to commence manufacturing in a few days. The Komo Rubber Cloth Works (Tokyo), which was burned on the 20th of May, is to rebuild on a large scale. The Nihon Cristall Rubber Works (Tokyo), changed its title to the Shibuya Rubber Works on the 15th of June.

CRUDE RUBBER IMPORTS.

The imports of crude rubber from January to April, 1916, amounted to 2,359,084 yen [\$1,179,542], increased 1,627,522 yen [\$813,761], comparing it with the amount imported in the same period in 1915.

JAPANESE PLANTATIONS IN MALAY AND BORNEO.

Japanese rubber plantations in Malay aggregate 85,850 acres, on the 147 plantations, at the end of 1915, in which acreage 27,880 acres are already planted and some yielding their products. The Nanyo Rubber Co., Limited, which was established for rubber plantation in Johore with capital of 200,000 yen [\$100,000] in December, 1910, doubled its capital in January of this year and purchased the Nanyo Oita Rubber Plantation Co., Limited, which was established for the same purpose in April, 1911, and planted 600 acres of total acreage, 1,301 acres. Thus the Nanyo Rubber Co., Limited, became possessors of a total acreage of 3,343 acres, 1,600 acres having been planted. On May 10 the Nanyo Rubber Cultivation Co., Limited, was established with 2,000,000 yen [\$1,000,000]. One-fourth of the sum was paid in, and a Chinese rubber plantation was purchased next to the Fujita-gumi Rubber Plantation (Japanese) in Johore, the Fujitama Rubber Plantation (established October, 1911), having 6,970 acres and having planted 3,797 acres. The total acreage of the newly purchased plantation is 6,630 acres, of which 1,790 acres are planted; that is, 150 acres of 6 and 7-year trees, 500 acres of 5-year trees, 700 acres of 3 and 4-year trees, etc. The plantation is yielding 50 piculs [660 pounds] a month, having 50,000 trees to be tapped and having 80 coolies and 50 workers.

In British Borneo there were no Japanese rubber plantations, but Mokutaro Yoneda had 1,000 acres and has now added to this. Fusanosuke Kuhara, one of the richest men in Osaka, purchased a plantation of 2,000 acres under the name of B. Tanabe, Mr. Kuhara's manager, paying therefor 180,000 yen [\$90,000], in which acreage 500 acres are planted, 70 per cent with *Hevea* trees and 30 per cent cocoa. The rubber trees will yield next year.

RUBBER PLANTING IN FORMOSA.

Rubber planting in Formosa has been of questionable profit, for hurricanes visit the island once or twice a year, and the climate is not as good or beneficial for rubber growing as the Malay peninsula. However, as the trees seem to stand these handicaps, a few planters have interested themselves in producing rubber, more as a curiosity than as a business proposition. According to the reports from The Fujikura Afforestation Department and The Murai Afforestation Department, the plantations produced a fair quality of *Manihot*.

THE FUJIKURA AFFORESTATION DEPARTMENT.

The Fujikura Afforestation Department was established as an attribute of The Fujikura Electric Wire & Rubber Co., Lim-

ited (Tokyo), in the south part of Formosa, in 1912, and its acreage is about 2,400 acres, in which was planted teak, *Manihot*, *Hevea*, camphor-trees, red sandalwood trees, and some other tropical plants. Among these, *Manihot* and teak have proved best fitted for plantation growth. The results in June, 1915, are as follows:

Manihot, planted in May, 1913, is 30 feet high and one foot in diameter, two feet from the earth, and has shown better results than in plantations in Java. In two years and a half after planting, the *Manihot* in Formosa can be tapped.

Hevea, planted in May, 1913, in one year and a half attains a height of 15 feet, the growth being about as rapid as in Malaya for the first two or three years, but it seems to grow more slowly from three years on in Formosa.

In Formosa, *Manihot* is the most successful rubber tree. By the hurricane of 1913, buds, leaves, branches and even trunks of *Manihot* were broken off, and the authorities and planters thought that the rubber plantation in Formosa would be hopeless. But, on the contrary, the injured trees grew their trunks larger than before, making the tapping period earlier than was previously expected.

Formosa, situated within the Torrid Zone, is able to grow *Hevea* trees and will, undoubtedly, yield as beneficial a product as the plantations in Malaya, although the growth is slower compared with that of Malaya. Crude rubber exhibited at the Formosa Exposition of May, 1915, the product of *Hevea* trees in the official garden in Kagi, Formosa, was recognized as of good quality.

Though the percentage of loss in washing for Para rubber is less than that of *Manihot*, the latter is more beneficial in Formosa for the reason that it can be tapped at from two and a half to four years, while *Hevea* trees need from seven to ten years. So rubber planting in Formosa is promising, if confined to *Manihot* planted on the slopes of hills protected from hurricanes.

THE MURAI AFFORESTATION DEPARTMENT.

The Murai Afforestation Department, established in 1910 by Kichibe Murai, a wealthy resident of Tokyo, planted *Manihot* and camphor trees, the latter to protect the former from the hurricanes. The total acreage is 2,773 Ko [6,018 acres], a Ko (Formosan measure) being 217 acres, in which 452 Ko [981 acres] are planted, and 1,300 Ko [2,821 acres] will be taken to cultivate tropical plants, except the acreage for roads, bamboo forests, refreshed forests and necessary uses. The results of the afforestation to June, 1915, are as follows:

	First (1912)	<i>Manihot</i>	Camphor Trees
Planted trees	42,162	192,036	
Complemental planted trees	41,325	183,371	
Trees in June, 1915	42,162	192,036	
Second (1913)			
Planted trees	36,220	189,100	
Complemental planted trees	17,597	141,205	
Trees in June, 1915	36,220	189,100	
Third (1914)			
Planted trees	52,769	258,440	
Complemental planted trees	5,701	2,430	
Trees in June, 1915	34,915	2,248	

When finishing the complemental plantation, camphor-trees will aggregate 383,384 and *Manihot* and *Hevea* 131,152, besides a few tropical trees, such as coffee, orange, teak and others.

Planting on the remaining 1,300 Ko [2,821 acres] has been postponed until results from present plantings prove financially successful.

NEW TARIFF FOR MOTORCYCLES AND RUBBER TREES.

The Diet of Japan in the spring passed two new customs tariffs, one for motor cycles and the other for rubber trees, as follows:

	New Tariff.	Old Tariff.
	United States	United States
	Currency.	Currency.
Motorcycle (combined with engine), each h. 93.60	\$46.80	\$30.60
Motorcycle (without engine), each h. 77.60	\$38.80	\$16.90
Rubber trees (without engine), each h. 77.60	\$46.80	\$46.80
Rubber trees (with engine), each h. 77.60	\$46.80	\$46.80

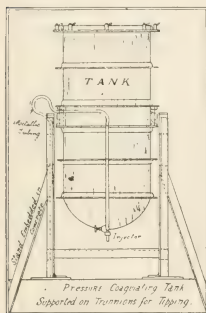
PATENT REGISTRY.

The Diet also decided that the terms of "New Idea Registry" of the Japanese Government shall be extended from six to ten years, but the duration of patents will continue to be 20 years.

THE ILCKEN-DOWN COAGULATION PROCESS.

IN the March, 1916, issue of THE INDIA RUBBER WORLD, a brief description was given of the Ilcken-Down method of coagulation. Since this process was introduced last October, several improvements have been made. One factory has been working this process for some months, and others are now beginning to use it. Some of the leading estates on the Peninsula have ordered tanks, to test the process on a large scale.

Briefly described, the improved process is as follows:



PRESSURE COAGULATING TANK.

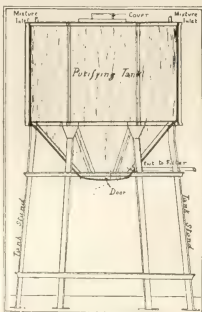
The fresh latex is strained into a tank, whence it runs into a second tank fitted with a stirrer and a cover, where it receives one-tenth of an ounce of glycerine to every gallon of latex, and is thoroughly stirred. As soon as the latex has coagulated, which will occur in from six to eight hours, and is visible by a soft, spongy clot having formed containing nearly all the serum, a mixture composed of any of the following agents: A—alcohol and B—petroleum-benzene, or A—alcohol and B—gasoline, is forced into the tank by means of an injector fitted at the base, and envelops the soft coagulum. It is found that good qualities of denatured or methylated spirit and benzine give most satisfactory results.

The time taken to transform the latex depends on the nature of the latex. The purer and the richer the latex, the quicker will it be transformed into a soft clot by the action of the glycerine, in which will be developed a certain bacterium called "Sorbosé" bacterium, transforming the glycerine into dioxyacetone and the dioxyacetone fermenting the enzyme action into ethylalcohol and carbon dioxide. On a large scale it is recommended that engine power be used for stirring for about five minutes. When stirring is completed, the stirring apparatus is removed from the tank, which is then covered.

When this clot is formed, the mixture of methylated spirit and benzine is gradually added to the latex, until a quantity of not less than 2 ounces per gallon of latex has been injected round the clot, thoroughly enveloping it.

Complete precipitation of the coagulum will have taken place and the serum is sufficiently clear in about 12 hours. The serum is run off and the hard coagulum may then be removed from the tank and made into slabs or creped.

After removing the rubber from the tank a certain amount of pure rubber in the form of fine flour (less than one per mil of the dry rubber weight) will be found in the tank. This should be poured into a clean cylindrical receptacle with tap at bottom and treated by separation in the ordinary way. The flour floats on top, and the serum is run off.



PURIFYING TANK.

It should be borne in mind that all delay that may arise from time of tapping to collecting and treating the latex with glycerine affects its coagulation. Therefore, to insure the best results the collection and treatment with glycerine should be done expeditiously, the spongy clot frequently forming in 6 hours.

For small estates zinc or earthenware column-shaped tanks about 6 inches diameter and 18 inches high, to treat 1 to 1½ gallons of latex, each, can be used. For these small tanks an injector is not necessary. The mixture is merely poured on the coagulum, and the tank is turned round by the hands in a circular direction from left to right and from right to left, thus insuring complete envelopment of the coagulum by the mixture.

NITRE CAKE IN RUBBER RECLAIMING.

ALMOST every type of rubber scrap is today treated for recovery. These types are generally divided into three general classes, fabric free, fabric bearing and ebomite.

Fabric bearing material includes such scrap as belting, hose, overshoes and auto tires. Preliminary to depolymerization and softening all fabric must be destroyed and removed. The fabric is usually cotton and is by various reagents changed into such a form that it may be removed by washing with water. The three principal methods of accomplishing this are the mechanical, the alkali and the acid. In the first method, which is now little used, the scrap is very finely ground and the fluffy fibre blown away. The second, the alkali method, consists in heating ground scrap with alkaline solution to destroy the fibre. The third is the acid process. In this the ground scrap is treated with a hot solution of sulphuric acid varying in strength from 15 per cent to 30 per cent, according to the character of the scrap and the fineness to which it has been ground.

As a result the cellulose of the fabric is charred and can be removed by thorough washing. This washed scrap, free from fabric, is then ready for the depolymerization and softening.

Sulphuric acid is no inconsiderable cost factor in rubber reclaiming and the increase in prices following the outbreak of the war has been keenly felt by the rubber reclaimer. Naturally, an acid substitute has been eagerly sought. In the manufacture of nitric acid by the treatment of sodium nitrate with sulphuric acid, there is produced a secondary product termed nitre cake, and this has proved in many industries the solution of the acid problem.

Nitre cake is a fused salt made up chiefly of sodium acid sulphate. It is readily soluble in hot water and has an average acidity of 32 per cent in terms of sulphuric acid. That is, three pounds of nitre cake approximately equal one pound of 66° acid. The chemical action of a nitre cake solution is practically the same as that of sulphuric acid solution, though it does not have the tendency of acid to char or burn organic matter. Nitre cake is shipped in lump form, either in bulk or barrels. Being a solid, its handling does not present the difficulties of handling acid, especially in carboys.

The substitution of nitre cake for acid in defiberizing rubber scrap is dependent upon the character of the scrap and the degree of fineness to which the scrap is ground or cracked, the strength of the acid solution being governed chiefly by this factor. A hot saturated solution of nitre cake is approximately equal in strength to an 18 per cent acid solution and a cold solution to a 15 per cent solution. Where a stronger solution is necessary it is prepared by dissolving nitre cake in dilute acid. This effects a partial substitution of nitre cake for acid. The method of treatment with a nitre cake solution is the same as with acid and the results the same, except as to the lack of the charring tendency where the nitre cake solution is used.

The grades of scrap treated and the variation in the method of treatment are so wide that it is really necessary for the reclaimer to make an actual trial to determine the applicability of this material to his needs. Certainly, it has merit for it is already being successfully used on a large scale.

Rubber Planting Notes.

COST OF PRODUCING PLANTATION RUBBER IN MALAYA.

FROM a survey of the annual reports of the various rubber companies in the Federated Malay States, it would appear that the average cost of production, f. o. b. steamer, including all expenses except interest charges on investment, was during 1915, approximately 25 cents per pound on well managed plantations in full bearing. Some companies were able to produce their rubber at somewhat lower cost, but quite a number of others reported higher costs which were in many cases due to charging the expense of operating the entire estate, including portions not in bearing, against the output of their productive areas. One company figures its proportionate charges as follows:

	Cents Per Pound.
Collecting and manufacturing.....	12.00
General administration charges, including superintendence and Singapore offices.....	3.40
Depreciation.....	4.00
Miscellaneous.....	25.00
Total.....	25.00

With the best grades of rubber ranging, during 1915, from 50 cents to \$1 per pound, it is easy to compute the substantial profits of rubber planting in Malaya.

EASTERN PLANTATION PRODUCTION.

A report from United States Consul Harry Campbell, detailed as vice-consul at Singapore, Straits Settlements, states that the production of plantation rubber in the East has increased during the last ten years from practically nothing to 70 per cent of the world's production. He gives the following figures in tons of 2,240 pounds as a verification of his statement, which in some respects differs from some statisticians' figures and estimates:

Year.	East.	Other countries.	Total.
1906.....	531	36,000	29,500
1907.....	1,133	38,000	69,133
1908.....	2,610	39,000	65,510
1909.....	3,997	42,000	69,997
1910.....	7,521	40,800	69,821
1911.....	13,773	37,730	74,703
1912.....	28,518	42,410	98,928
1913.....	47,302	39,370	108,172
1914.....	71,959	37,000	120,959
1915.....	102,600	36,750	144,750

Estimating the output for 1915 at an average of 67 cents per pound, which the consul believes is slightly below the actual figure, he places the selling value at \$215,000,000, of which \$155,000,000 is attributable to the Middle East plantations. As these have a total capitalization of about \$282,000,000, his estimate suggests an average profit of about 50 per cent, covering all plantations, both producing and non-producing. He believes this is a fair estimate, because many of the producing companies are reported to be reaping profits of 100 to 200 per cent.

RUBBER CULTIVATION IN HAINAN.

The first exportation of rubber produced in the island of Hainan, China, was shipped in 1915.

Rubber trees were introduced in Hainan in 1910 by two Chinese companies. There are 4,000 in the Lo Hui district. 2,000 of which began to be tapped in April, 1915.

About 400 pounds of rubber was sent to Singapore between June and the end of 1915, which realized about 37 cents per pound. The rubber is said to have been of first quality, but faultily prepared and was therefore sold as second quality. The introduction of machinery will doubtless improve the product.

Since 1910, Chinese interests have planted \$2,000 *Hevea* rubber trees in the vicinity of Modoa, Hainan, but these are still young and are not expected to produce for another two years.

SMOKING RUBBER.

Replying to an inquiry in regard to the best wood for producing dense smoke for curing rubber, our South India contemporary "The Planters' Chronicle," says:

Any kind of Indian jungle wood may be used, but it should not be too green as the smoke would then contain too much moisture, with the result that the rubber would dry slowly and be apt to be over-smoked. The best results are obtained with a judicious mixture of dead, dry timber with green wood. *Hevea* logs obtained from thinning out may be used, but they should be first stacked in the sun to dry.

It is not so much the kind of wood which is used, as the type of furnace which produces the best smoke. A comparatively slow rate of combustion should be aimed at. This produces a dense smoke, with a low proportion of fine ash to contaminate the rubber in the smoke-house. The draught should be kept low and the combustion regulated so that the wood glows and smoulders, leaving a high proportion of charcoal at the end instead of white ash.

VALUATION OF RUBBER TREES.

The "Straits Budget," Singapore, Straits Settlements, published the following interesting information regarding the valuation of rubber trees:

In response to an inquiry from a government department as to the value planters placed upon rubber trees at varying ages, a sub-committee was appointed which drew up a standard valuation as follows:

Age of Tree.	Value in United States Currency.		Number of Trees per Acre.
	Tapped.	Untapped.	
3 months.....	\$0.28	.....	150
6 months.....	.....	34	150
9 months.....	.....	40	150
1 year.....	.....	45	150
2 years.....	.....	75	150
3 years.....	\$0.85	1.13	150
4 years.....	1.32	1.51	150
5 years.....	2.72	.....	125
6 years.....	3.47	.....	110
7 years.....	4.25	.....	100
8 years.....	6.97	.....	90
9 years.....	6.02	.....	80
10 years.....	6.37	.....	80

The standard valuation presumes: (a) that the tree is well grown on good soil; (b) that the tree is healthy; (c) that the tapping has been careful and moderate; (d) that the planting has not been too close, or if originally too close that it has been thinned out; (e) that the expenditure on the estate has been normal; (f) that no pest has attacked the tree; (g) that the price of best rubber is 2s. 4d. a pound [56 cents].

THINNING OUT RUBBER.

Much has been written on the subject of thinning out rubber, but it appears that no fixed rules have yet been determined.

At a recent meeting of the Committee of Agricultural Experiments at the Peradeniya School of Agriculture, Ceylon, J. S. Patterson submitted some figures showing the result of thinning out on a plantation 20 years old. These figures showed that profitable results appeared to follow the thinning out of a plantation even at this age. The original number of trees was 161 per acre and thinning out during three years brought the number down to 105 trees per acre. The yield had at first dropped from 439 pounds to 400 pounds of dry rubber per acre but had risen to 439 pounds again and appeared to be continuing upon the upward trend.

Questioned as to whether it would be more profitable to begin thinning out at an early date or leave it until the plantation was, say, 20 years old and then thin out, several members of the committee offered remarks, generally agreeing that there were no data upon which to base definite conclusions on this subject. It depended upon so many factors—the original spacing, climate and price of rubber. Nevertheless, the consensus of opinion

was that thinning out should not be delayed too long but should be done early enough to allow the trees ample opportunity to branch.

RUBBER IN SOUTHERN INDIA.

According to a recently issued report, the Pudukud Rubber Co., Limited, has already paid a 5 per cent *interim* dividend and will probably pay a further dividend of 10 per cent for 1915. Last year's rubber crop was 123,481 pounds, which came from 653¼ acres, the total number of trees tapped being 88,155 and the yield per tree 1.56 pounds against 0.81 pounds in 1914. The total area under rubber was 822 acres.

The Kinalur Rubber Co., Limited, which held its first general meeting in Madras May 17, harvested 22,493 pounds of dry rubber last season, as compared with 1,814 pounds in the previous year, and it was stated that the company was likely soon to pay its first dividend. These are remarkable results for plantations that, for the most part, are six years old or less.

BOLIVIAN RUBBER INDUSTRY.

The Bolivian rubber industry has been enjoying some improvement; 1915 exports are estimated to have been over 5,000 tons, as against 4,485 tons in 1914. This improvement was mainly due to higher prices obtained in 1915 for the product, and it is believed that after the war Germany will be a large purchaser of Amazonian rubber, as practically all other rubber comes from lands controlled by the Entente Allies, who, it is believed, will subject the Germans to disadvantages of various kinds.

NEW BOLIVIAN RUBBER CORPORATION.

The Bolivia-Brazil Rubber & Timber Corporation is the name of a company recently incorporated under the laws of the State of Arizona, capitalized with 1,000,000 shares of a par value of \$1.00 per share. The announcement of incorporation says that the company has acquired 82,000 acres of rich land along the Madeira and Negro rivers, the latter an affluent of the Abuna, in the Republic of Bolivia. It is stated that this land abounds in rich forests of rubber trees, hard cabinet woods, Tagua nuts (used extensively in making buttons), and other tropical products.

The corporation expects to begin active work on the properties this month with a view to begin tapping the rubber trees early in the coming year. The gathering and preparation of the crude rubber will be carried on under the modern methods. It is planned to supplement gathering wild rubber by establishing large plantations of rubber trees.

CHICLE CONCESSIONS IN VENEZUELA.

The Venezuelan Government has recently granted José Patrocinio Cuellar the exclusive right to export chicle from Venezuela. This concession will be effective during the life of a contract made by the Government in 1912, giving the sole privilege of extracting chicle in Venezuela.

According to United States "Commerce Reports," exports of chicle from Venezuela to the United States have been rapidly increasing, the amount shipped in 1915 being 952,358 pounds, or four times the total shipments of Venezuelan chicle to this country from 1912 to 1914, inclusive.

EXPORTS OF CHICLE FROM BRITISH HONDURAS.

Exports of chicle, or *sapodilla* gum, from British Honduras in 1914 (last statistics published) amount to 3,461,809 pounds, valued at \$1,125,519, as compared with 3,163,129 pounds in 1913. Only one-third of this export was the produce of the colony. The United States received almost all of this chicle.

THE SITUATION IN BRAZIL.

By Our Special Correspondent.

GENERAL conditions in the crude rubber trade here in Brazil are better to-day than they have ever been since the development of plantation competition. The situation has been gradually improving and we are now looking forward to real prosperity.

The decline of exchange has had its effect on the currency prices of our crude rubber and, as a result, those engaged in gathering, preparing and dealing in rubber are prospering, and the position of the Para and Manaos markets is stronger than it ever was before. The depreciation of the pound sterling in this country has, therefore, been of incalculable benefit to our rubber industry.

We are approaching the close of the Amazon 1915-1916 rubber season. The crop shows a considerable increase over that of 1914-1915 and it is expected that the 1916-1917 crop will be larger still, very likely the largest ever harvested in Brazil. Provided exchange does not advance, continued and increased prosperity may be very reasonably expected, and, at the close of the war, we are sure to do wonderful business with Germany.

MANAOS ATHLETIC CLUB INAUGURATED.

The Manaos Athletic Club has recently completed a comfortable club house on its grounds in that city. Naturally, a large number of men connected with the rubber trade are



members, and several may possibly be recognized by a close examination of the picture, which was taken at the inauguration of the club.

GERMAN REQUIREMENTS.

The Germans will need large quantities of crude rubber which they will hardly be disposed or possibly will be unable to obtain from lands under the control of the Entente Allies. It is therefore probable that they will look almost exclusively to South America for their supplies of this commodity.

BRITISH BLACK LISTS.

Many of our large rubber dealers, who have contributed in the past to the greatness of our crude rubber industry, are Germans or at least have German affiliations, and for this reason they have been blacklisted by the British Government, with the result that they are unable to ship their goods in British bottoms

—practically the only ones now available. Further, a number of national concerns have also been "blacklisted" for having assisted the Germans, by allowing them to ship under their names.

At first much resentment resulted from these British measures, but now we are beginning to understand that Great Britain's shipping and commerce are world-wide and interference is therefore world-wide in its effects. At the beginning there was a belief that the British blacklists were aimed against Brazil, for the purpose of favoring British plantation rubber, but this feeling is rapidly vanishing.

RUBBER VALORIZATION.

The press here is again talking of rubber valorization and of the law for the protection of articles made of Brazilian rubber, which it was found impossible to apply.

To revive this question—which has always been fruitless—is really childish. One need only recall the disastrous attempt at valorization which occurred in 1909 when the production of plantations was insignificant as compared with that of Brazil. What would valorization lead to now that the positions have been more than reversed? Last year the plantations of the Orient produced close to 100,000 tons of crude rubber against Brazil's 35,000 tons, and even under the present favorable conditions, and the trade prospects after the war, there is nothing to encourage the belief that our production of crude rubber under the present system will ever approach that of the plantations. Before valorization could prove any measure of success we should create and develop a rubber plantation industry on Eastern lines. We must have vast, easily accessible plantations, in full production and equipped with the most modern machinery, before we can hope to regain our lost leadership.

If we will get to work and profit by the lessons the East has demonstrated, if we will organize real plantations and take proper care of our trees instead of tapping them to death, as is now the practice, then we may be able to get as good, possibly better prices than the East. Such a course would be far more advantageous to the nation than any valorization chimera.

RUBBER PLANTATIONS IN BRITISH GUIANA.

THE official report of the British Guiana Department of Science and Agriculture for the year 1914-15, recently published, states that the total area under rubber cultivation in the colony was 4,962 acres, an increase of 743 acres over the previous year. It consists almost entirely of *Hevea Brasiliensis* and by far the greater proportion of the trees have not yet reached maturity. It is anticipated, however, that tapping operations will be commenced on a fairly extensive scale during 1916.

The rate of growth of the trees in the colony, generally, was more rapid than it was in 1913-14 and considerably greater than in the year 1912-13. During the year 1911-12 the trees were badly afflicted by a prolonged drought.

EXPERIMENTAL TAPPING.

Experimental tapping was continued at Issorora and On-denreeming during the year; tapping was also commenced at Christianburg towards the end of the year.

At Issorora the tapping of 379 trees in one experiment was commenced in November, 1913, a basal V being employed as the tapping system and the trees being tapped every day. In January, 1915, the tapping of the surface of bark (18 inches high and $\frac{1}{2}$ circumference of the tree) marked out for the experiment was completed. Altogether, 714 pounds of dry rubber were collected at an average cost of 16 cents per pound. The trees in this experiment were not adjacent to each other, but were scattered through the older part of the rubber cultivation of the station, and the total number, 379, was found to be rather more than a fair task for one man to tap in a morning. These two factors resulted in the

cost of tapping being higher than it would have been had the conditions been more favorable for the experiment. However, this cost of collection for an initial experiment was considered to be quite reasonable.

In February, 1915, another experiment was inaugurated; 300 trees, the number regarded as a fair task for one man to tap in a morning, being tapped each day with a basal V on the opposite half of the tree to that tapped in the previous experiment. Up to the end of the financial year (March 31), 260 pounds of wet rubber had been collected, the equivalent of 130 pounds dry, at a cost of 7 cents a pound.

The results of these experiments lead the Department of Science and Agriculture to believe that rubber can be collected at a low cost in British Guiana, if the trees are grown under proper estate conditions.

Tapping experiments at other experimental stations were less extensive than at the Issorora station and had not been sufficiently long in progress to enable any accurate conclusion to be drawn as to the probable cost of collection per pound.

The results obtained at the Issorora experimental station, both in regard to cultivation and tapping of cultivated *Hevea Brasiliensis*, caused much interest among farmers. Towards the close of the year 9,000 *Hevea* seedlings were planted on various grants and general progress was made on the grants of the Consolidated Rubber and Balata Co., during the year, in connection with planting and tapping operations.

BARTICA RUBBER.

Some news and views of the Bartica Agricultural States Plantation in British Guiana were published in the June 1, 1916, issue of THE INDIA RUBBER WORLD. Since that date the first shipment of crude rubber from that plantation has been re-



ceived in this country. It has been valued at fully equal to first latex crepe. Now that the 600 acres are coming into bearing, the Bartica brand is likely to be well known. The accompanying view is of one end of the dry-house on this plantation, and shows the first product from five-year-old *Hevea*.

RUBBER EXPORTS FROM TRINIDAD.

According to a recent report of the Agricultural Society of Trinidad, B. W. I., rubber is showing up somewhat better on that island, but is still a disappointing item in the exports of the colony. Very few planters have realized expectations.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED MAY 2, 1916.

- N**O. 1,181,133. Tire pressure gauge. W. P. Hammond and T. A. Hammond, Easton, N. J., assignors to A. Schrader's Son, Inc., New York City.
- 1,181,134. Curling iron having a liquid fuel reservoir and air bulb. G. H. Harper, Oklahoma, Okla.
- 1,181,243. Tire protector. W. A. Otto, Milwaukee, Wis.
- 1,181,263. Wheel tire. C. Schragin, Berlin, Germany.
- 1,181,277. Grip tread for vehicle tires. H. D. Weeld, Syracuse, N. Y., assignor to American Chain Co., Inc., Bridgeport, Conn.
- 1,181,280. Hose coupling. G. J. Winter, assignor to The Republic Hose Coupler Corporation—both of Buffalo, N. Y.
- 1,181,430. Fountain pen. W. K. Buckles, Rifle, Colo.
- 1,181,441. Boot or shoe. J. W. Franklin, assignor to National India Rubber Co.—both of Bristol, R. I.
- 1,181,540. Pneumatic tire. H. D. Peaslee, Fresno, Calif.
- 1,181,574. Fountain pen comprising a barrel containing a self-expansible rubber sack. S. S. Crocker, Wollaston, Mass.
- 1,181,646. Waterproof toilet bag. V. E. Davis, New York City.
- 1,181,670. Rim holding device. J. Kelsey, Detroit, Mich.
- 1,181,676. Hose coupling. C. H. Lambin, New York City.
- 1,181,744. Fountain pen filler. J. W. Croser, New York City.
- 1,181,841. Tire armor. A. J. Chabot, Marlboro, Mass.
- 1,181,891. Raincoat. H. H. Hulbert, Excelsior, Minn.
- 1,181,937. Bias lining fabric package. W. C. Stevens, assignor to Firestone Tire & Rubber Co.—both of Akron, Ohio.

ISSUED JUNE 20, 1916.

- 1,187,489. Heel protector for rubber shoes. C. Besse, Watertown, Mass.
- 1,187,539. Tire valve tightener. C. D. Miller, St. Joseph, Mo.
- 1,187,553. Hose connection. J. A. Rordan, Rochester, assignor of thirty-five one-hundredths to N. G. Rordan, Salamanca—both in New York.
- 1,187,624. Auto tire. N. E. Illig, assignor to E. F. Shugart—both of Erie, Pa.
- 1,187,637. Pneumatic tire. A. Malsin, New York City.
- 1,187,654. Safety tire valve. E. J. Ryan, assignor of one-half to F. M. Welsh and one-twentieth to M. H. Darby—all of Long Beach, Calif.
- 1,187,666. Antiskid horseshoe calk. V. Slaninka, Swanton, assignor of one-half to H. Dietz, Rossford—both in Ohio.
- 1,187,820. Demountable rim. J. B. Dace, Rushville, Ill.
- 1,187,838. Musical rubber ball. R. D. Hughes, assignor to W. J. Almond, F. H. Almond and C. H. Almond, Jr.—all of Lynchburg, Va.
- 1,188,034. Antiskid tread. E. H. Bingham, San Francisco, Calif.
- 1,188,062. Flat section pneumatic tire. J. L. Gammett, Akron, Ohio, assignor to The B. Goodrich Co., New York City.
- 1,188,180. Surgical tip. C. E. Kells, New Orleans, La.
- 1,188,195. Tire and retainer. E. F. Morse, assignor of fifteen thirty-seconds to W. F. Knap—both of Des Moines, Iowa, and nine thirty-seconds to W. C. Park, Galveston, Texas.
- 1,188,200. Demountable rim. O. A. Parker, Cleveland, Ohio.
- 1,188,233. Pneumatic automobile tire body with a plurality of spaced cells containing air. J. C. Anderson, Washington, D. C.
- 1,188,271. Self-filling fountain pen. J. Harris, New York City.
- 1,188,276. Inflation device for multiple chambered tires. W. L. Ireland, Grand Lodge, Mich.
- 1,188,311. Electrically illuminated fountain pen. H. Pendleton, assignor of one-half to M. A. Spaulding—both of Kokomo, Ind.
- 1,188,347. Friction plug rubber heel. F. J. Gleason, Walpole, assignor to Standard Woven Fabric Co., Framingham both in Massachusetts.
- 1,188,348. Rubber heel. F. J. Gleason, Walpole, assignor to Standard Woven Fabric Co., Framingham both in Massachusetts.

ISSUED JUNE 27, 1916.

- 1,188,394. Fountain pen. M. Bernstein, New York City.
- 1,188,478. Apparatus for enteric lavage. L. C. Fair, Dallas, Texas.
- 1,188,588. Brake lining and similar material. E. E. Waite, assignor to Standard Woven Fabric Co.—both of Framingham, Mass.
- 1,188,598. Vehicle wheel with pneumatic cushions. A. J. Wolff, Hartford, Conn.
- 1,188,668. Soap carrier and massage device. G. A. Madison, St. Paul, Minn.
- 1,188,694. Inner tube for pneumatic tires. A. L. Stanford, Chicago, Ill., assignor of one-half to R. B. Gillette, Eau Claire, Wis.
- 1,188,701. Automobile tire. W. H. Strouse, Oskaloosa, Iowa.
- 1,188,739. Pneumatic tire. C. A. Davis, Brackton, Mass.
- 1,188,823. Tread brush attachment. T. R. Plank, Los Angeles, Calif.
- 1,188,904. Bottle protector of rubber. J. E. Gosgriff, New York City.
- 1,188,998. Tire plug. L. V. Rood, Marietta, Ohio.
- 1,189,091. Cushion tip for the keys of typewriters and like machines. E. H. Gemmill, Akron, Ohio, assignor to Thorp & Martin Typewriter Co., Boston, Mass.

ISSUED JULY 4, 1916.

- 1,189,223. Vehicle wheel including a pneumatic tire. L. Albrecht, New York City.
- 1,189,404. Clamp for hose and the like. F. J. Stulp, Muskegon, Mich.
- 1,189,408. Rubberized cloth for billiard tables. J. Turner, Dorchester, Mass.
- 1,189,421. Means for locking demountable tire rims. G. G. Bayne and A. W. Knutson, Quincy, Ill.; Knutson assignor to Bayne.
- 1,189,424. Tire tool. F. H. Burrill, assignor to The Burrill Tire Tool Co.—both of Concord Junction, Mass.
- 1,189,446. Demountable rim. C. C. Harbridge, assignor to Detroit Demountable Rim Co.—both of Detroit, Mich.
- 1,189,472. Rubber heel with metal wear plate. J. Opperud, Madison, S. D.
- 1,189,485. Automobile tire. J. C. Reinsford, Seattle, Wash.
- 1,189,505. Tooth brush with liquid containing bulb. L. C. Stockton, Denver, Colo.
- 1,189,511. Pneumatic tire. C. E. Vawter, Blacksburg, Va.
- 1,189,569. Automobile tire tread. W. H. Henderson, Omaha, Nebr.
- 1,189,586. Nursing syringe. J. B. A. LaJeunesse, Alameda, Calif.
- 1,189,589. Furling brasserie. L. Lawrence, Vancouver, British Columbia, Canada.
- 1,189,654. Pneumatic tire. B. Barrow, Barrows Store, Va.
- 1,189,730. Tire. M. C. Overman, New York City.
- 1,189,788. Resilient tire. T. L. Carbone, Charlottenburg, Germany.
- 1,189,789. Resilient tire. T. L. Carbone, Charlottenburg, Germany.
- 1,189,845. Tire. S. Lioilis, Charleston, Mo.
- 1,189,857. Puncture proof automobile tire supporter. C. O. Myers and H. T. Maring, Gettysburg, Pa.
- 1,189,859. Rubber heel. F. Neger, Chicago, Ill.
- 1,189,923. Tire tool. R. W. Damaron, Jackson, Mich.
- 1,189,937. Eraser. B. B. Goldsmith, New York City.
- 1,189,989. Pull-up attachment for overshoes. L. R. Moore, San Rafael, Calif.
- 1,190,017. Hair-driving device comprising a bulb of rubber. G. L. Scheel, Chicago, Ill.
- 1,190,065. Pneumatic tire sleeve or patch. R. Yost, Tyrone, N. Y.
- 1,190,068. Hose coupling. R. J. Abbott, Washington, D. C.
- 1,190,118. Wheel rim. W. E. Copithorn, Natick, Mass.
- 1,190,144. Pneumatic tire. M. A. Gibbons, Des Moines, Iowa.
- 1,190,179. Bath mat. E. L. Livingston, West Orange, N. J.
- 1,190,228. Fountain brush. J. Barlow Fesler, assignor to Fesler Sales Co.—both of New York City.

ISSUED JULY 11, 1916.

- 1,190,266. Bath mat. E. R. Crocker, Los Angeles, Calif.
- 1,190,474. Pneumatic tire and process of making. J. H. Seiberling, Jönköping, Sweden.
- 1,190,497. Rubber stamp type holder. M. L. Willard, assignor to Superior Type Co.—both of Chicago, Ill.
- 1,190,602. Brasserie. S. Sorkin, New York City.
- 1,190,744. Inner tubes for pneumatic tires. F. Fenton, Akron, Ohio.
- 1,190,781. Sponge rubber hand grip for steering wheels. D. F. Maher, Waterville, Calif.
- 1,190,790. Well packer having a rubber body. F. J. Moser, Kane, Pa.
- 1,190,866. Tire valve attachment. H. F. Crawford, Brockton, Mass.
- 1,190,867. Fountain pen provided with reservoirs for different colored inks. H. C. Crosby, New York City.
- 1,191,065. Demountable rim. W. E. Copithorn, Natick, Mass.
- 1,191,081. Demountable rim. J. S. Johnston, Utica, N. Y.
- 1,191,101. Detachable rim clamp. D. E. Agnew, assignor of one-half to H. F. Sullivan—both of Portland, Oreg.

THE UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

In order to give the public the advantage of having abridgments of specifications up to date while retaining their numerical sequence, applications for patents made subsequent to 1915 are given new numbers when their complete specifications are accepted, or become open to public inspection before acceptance. The new numbers start with No. 100,001 (without any indication of date), and supersede the original application numbers in all proceedings after acceptance of the complete specifications.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 7, 1916.]

- 2,449 (1915). Hose pipe and like clamps. F. Neppach, 63 Karlstrasse, Cannstatt, Stuttgart, Germany.
- 2,451 (1915). Rubber hose coupling. R. Barnfather, 105 Margravine Avenue, Hammersmith, London, W.
- 2,489 (1915). Section grip for portable electric lamps. H. J. C. Forrester, 75 New Street, Birmingham.
- 2,510 (1915). Corsets comprising elastic sections. R. Charney, 8 Chatnam Street, Piccadilly, Manchester.
- 2,512 (1915). Gramophone with rubber bulb and tubing. G. T. Waite, 122 High Street, New Bromwich, near Birmingham.

- 2,606 (1915). Rubber covered roller. J. Muskett, 42 Delamere avenue, Dunston Park Road, Pendleton, Manchester.
- 2,638 (1915). Collapsible hinged segment tire rim for aeroplanes, etc. Dunlop Rubber Co., 14 Regent street, Westminster, and C. MacFeth. Manor Mills, Salford street, Aston Cross, Birmingham.

2,675 (1915). Detachable rim for vehicle wheels. A. H. Greenfield, 92 Earl's Court Road, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 14, 1916.]

2,739 (1915). Rubber cement in hat manufacture. C. Clermont, 66 Hyde Road, Denton, near Manchester.

2,753 (1915). Stoppers for hot-water bottles and method of insertion. T. T. Brown, 2 Carson Road, Levenshulme, Manchester.

2,778 (1915). Cushion wheel tire. J. F. Vander Velde, 12d Bezuidenhout street, Trojeville, Johannesburg, and J. Hosking, 364 Harpur avenue, Benoni, Transvaal.

2,776 (1915). Sock suspender. C. A. Hamlin, 16 Hobson Buildings, Shortland street, Auckland, New Zealand.

2,946 (1915). Vulcanite reflectors. M. Wiskott, 3 Flurstrasse, Breslau, Germany.

2,952 (1915). Rubber wheel tire. J. Cairns, 27 Payne avenue, Hove, Brighton.

2,959 (1915). Reservoir pens. E. M. Wade, 65 Cavendish Drive, Rock Ferry, Cheshire.

3,015 (1915). Tent pole comprising a rubber spring. F. Schultz, 125 Voorhout street, Trojeville, Johannesburg, South Africa.

3,029 (1915). Inflatable life saving jacket. J. C. Steer, 9 Evans Terrace, Swansea.

3,103 (1915). Finger-stall of chamois with an attached elastic band for holding it in position. L. L. Williamson, 145 Addycombe Terrace, Heaton, Newcastle-on-Tyne.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 21, 1916.]

3,138 (1915). Tow operated by rubber bands. C. T. Eaton, 84 Eaton Terrace, London.

3,171 (1915). Cushion tire. T. Whitehead, Bela Grove, Blackpool, Lancashire.

3,213 (1915). Device for anchoring or attaching electric cables having an external rubber sheathing. A. E. Foster, 86 Mayron Road, Charlton, Kent.

3,235 (1915). Non-skid pad for wheel tires. A. E. Walkden, 46 Trafalgar Road, Egremont, Cheshire.

3,251 (1915). Rubber packing in siphon heads. J. R. Trigwell, "Rayleigh," Bishop's Park Road, Norbury, Surrey.

3,326 (1915). Garment comprising a rubber strip. W. S. Naylor, "Clifton Junction," London.

*3,441 (1915). Inflatable life buoy the shape of a sailor's collar and adapted to be secured and concealed by the collar of a garment. W. G. Browne, Highbury, North Carolina.

*100,335 (1916). Device intended to prevent the heel of an over shoe from slipping. F. W. Ostrom, 78 Church street, Newark, New Jersey.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 28, 1916.]

3,568 (1915). Rehabilitating old tires, employing layers of rubber and rubber proofed asbestos. E. C. Langton, 238 Sebert Road, Forest Gate, Essex.

3,623 (1915). Jackets and covers for tires. D. R. Shewan, 1541 22nd Avenue East, Vancouver, British Columbia, Canada.

3,625 (1915). Kithbags and sleeping valises. A. M. Bellingham, 11th (Service) Battalion, Middlesex Regiment, Aldershot.

3,754 (1915). Tire attachments to rims. R. S. Stephen, 4 Gillespie Crescent, Edinburgh.

3,788 (1915). Raising sunken bodies by means of inflatable air bags. C. Dabretto, 74 Corso Vittorio Emanuele, Turin, Italy.

100,360. Rubber glove for use in teaching writing. A. Usterud, Boleveien, Skien, Norway.

100,362. Pneumatic tire cover. E. L. De Bayo, 16 Alameda Mazaredo, Bilbao, Spain.

100,371. Tire tool. D. R. Lewis, Trebanos, near Pontardawe, Swansea Valley; F. J. Morgan, 30 Wind street, Swansea, and D. H. Thomas, 56 Waun Road, Morristown—all in Glamorganshire, and A. D. Berk, 1 Fenchurch avenue, London.

*100,381. Cushion tire. J. Milne, 30 Church street, New York City.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

479,299 (July 17, 1915). Improved suspenders. Société de Caoutchouc Manufacture.

479,360 (July 17, 1915). Improvements in canvas suspenders. Société de Caoutchouc Manufacture.

479,208 (July 19, 1915). Improved wheel for automobiles. A. C. Dunham, 479,340 (March 26, 1915). Improvements in elastic wheels. B. J. Mattingly, 479,407 (July 28, 1915). Detachable rim. E. Dubouef.

479,502 (August 13, 1915). New rubber glove and method for its manufacture. Société de Caoutchouc Manufacture.

479,504 (August 13, 1915). Pneumatic tire. E. V. Roberts.

479,535 (August 14, 1915). Elastic tire for wheels. J. P. Murray and C. F. Wood.

479,543 (August 15, 1915). Process for manufacturing rubber agglomerates. J. Daura Mundi.

479,550 (August 18, 1915). Rubber overshoe. A. Johnston and The North British Rubber Co., Limited, Philadelphia, Pa.

479,604 (August 27, 1915). Detachable, interchangeable wheel for automobiles and similar vehicles. W. Baker, J. S. Foley, and Baker Rim Co.

NEW ZEALAND.

ISSUED MAY 11, 1916.

*35,790. Talking machine sound box of rubber. A. D. Jones, 46 Sibley Building, 1214 Filbert street, Philadelphia, Pa.

36,604. Tire filler. J. Flint and G. Bolton, Main street, Katoomba, N. S. W., and W. A. MacLauchlan, 44 Victoria Road, Marrickville.

37,099. Tire clasp. G. H. Broughton, 7 Spruce Court, Toronto, Canada.

37,233. Stayette. M. J. Taylor, Rickard avenue, Bondi, Sydney, N. S. W.

36,293. Milking machine test cup. G. W. Gane, Normanby, and J. Hopkirk, Hawera—both in New Zealand.

*37,085. Tire repair outfit box and press. A. J. Bert, Elizabeth Bay Road, Sydney, assignee of W. M. Holliday, St. Thomas Rectory, Mulgoa Road, Penrith—both in New South Wales.

*37,344. Wheel pressed metal. Simmons Wheel Co., Room 718 State Bank and Trust Building, assignees of O. G. Simmons, 3120 N. Flores street—both in San Antonio, Texas.

TRADE-MARKS.

THE UNITED STATES.

92,483. An illustration of a section of a tire with the word IMPERATOR across the center—rubber automobile tires. Sporn Tire Co., Chicago, Ill.

93,311. The word SWAGO—Asbestos, rubber, and composition packing. Neptune Packing and Rubber Co., New York City.

90,566. The word TWIND—combined rubber and fabric hose. Oxwell Acetylene Co., Chicago, Ill.

93,365. The words PRISY FOOT—boots and shoes of leather, rubber, etc. The Hurlbut Co., Limited, Preston, Ontario, Canada.

95,423. The word SILVERAGE—raincoats and capes. C. Kenyon Co., Brooklyn, N. Y.

84,585. An illustration with the words PHARIS PACKARD—pneumatic tires and inner tubes. The Pharis Tire & Rubber Co., Newark, Ohio.

85,465. The words NON LEAKABLE, NO LOST TIME, NO LUGGING, NO LIES, written one above the other and on top an illustration of a tire with the letters F A B in the center—cement for stopping leaks in punctured pneumatic tires. F. A. Buono, Hackensack, N. J.

92,606. Illustration of a tire with blue bands or stripes positioned circumferentially and on opposite sides of the center-line of the tread portion—elastic vehicle tires. The Goodyear Tire & Rubber Co., Akron, Ohio.

94,411. The word VICTOR—belt dressing and balata cement. Victor Balata & Textile Belting Co., Easton, Pa., and Brooklyn, N. Y.

94,432. The word RICO—rubber tubes and rubber tires. Rubber Insulated Metals Corporation, Richmond, Va., and Plainfield, N. J.

94,695. The word NAUGHAYDE—carriage cloth. American Rubber Co., Boston, Mass.

94,696. The word DRYBAC—carriage cloth. American Rubber Co., Boston, Mass.

94,857. The word MULTIO—friction tape. Standard Woven Fabric Co., Framingham, Mass.

94,858. The word STANWAVE—friction tape. Standard Woven Fabric Co., Framingham, Mass.

94,737. The word WALXMOH—heels and soles of boots and shoes. Fellaway Rubber Co., Medford, Mass.

88,634. The words RUB-STEEL—rubber valves. Voorhes Rubber Manufacturing Co., Jersey City, N. J.

94,185. The word LILY—rubber gloves for general use, brassieres, rubber bathing caps, and infants' bibs. Brooklyn Shield & Rubber Co., Brooklyn, N. Y.

94,567. Two concentric circles with the word ENDUROID—a substitute for leather. Endurance Tire & Rubber Co., New Brunswick, N. J.

94,889. The word NORBY—rubber hose reinforced with fabric. Eureka Fire Hose Manufacturing Co., New York City.

95,673. The word NMO—abdominal belts made of rubber, cloth, and combinations of rubber and cloth. Kops Bros, New York City.

95,845. Pictorial representations, in the center the words HAPPY HIKER—boots and shoes made of leather or canvas with leather, felt, or rubber soles. George R. Jones Co., Manchester, N. H.

THE FRENCH REPUBLIC.

9,901. The name LE 75 rubber goods, shoe heels, etc. Michel Desquenes, Bion.

9,902. The name LE 105—Same.

*23,869. The word GARLOCK into a lozenge—packings. Garlock Packing Co., Palmyra, N. Y.

*23,931. The word WALOIN—dry goods and corset stays covered with vulcanized rubber. Walen Manufacturing Co., New York, N. Y.

24,350. A rhinoceros with the word DERMATINE—rubber goods. Dermatine Co., Limited, Camberwell, London, S.E., England.

160,665. The word ASSASSOIR—substitute for wood. Camille Tichaut, Paris.

*Denotes Patents for American Inventions.

- 160,666. The word **PAPERBOLD**—Same.
 160,667. The word **CARTERBOLD**—Same.
 160,668. The word **CALBORN**—Same.
 160,671. The name **L'ARRY**—liquid and paste containing rubber for cold proofing fabrics and leather. Gustave Pary, Paris.
 160,695. The name **Le POILU**—pneumatic tire casings and tubes, and other bicycle accessories. Ernest Veluard, Paris.
 160,918. The name **LA VICTORIEUSE**—garters, suspenders, braces, belts, tobacco pouches, bibs, bed cloths, dress shields, craters, toys, waterproof garments, cushions, elastic fabrics, finger cots, proofed fabrics, all of rubber or containing rubber. Société de Caoutchouc Manufacture, Paris.
 160,919. The name **Le VICTORIEUX**—Same.
 160,920. The name **Le Coq GLOIREUX**—Same.
 160,921. The name **TOMMY**—Same.
 160,922. The name **MARNE**—Same.
 160,923. The name **JOFFRE**—Same.
 160,924. The name **JOFFRINE**—Same.
 160,925. The name **JOFFRETTE**—Same.
 160,926. The name **JOFFRETTINE**—Same.
 160,927. The name **FRANCE DE GLOIRE**—Same.
 160,928. The name **MARCHEL JOFFRE**—Same.
 160,929. The name **SOUVENIR D'ALSACE**—Same.
 17,059. The word **ZENITH**—erasers. Jules Vru, Marseilles.
 161,130. The word **ERIN**—erasers. G. Michaud, Quantin & Cie., Paris.
 161,131. The word **ECRITOIRE**—erasers. Desvernay & Cie., Paris.
 161,133. The name **No. 301**—erasers. Fargard & Leuba, Paris.

DESIGNS.

THE UNITED STATES.

- 48,959. Garter. **L. S. Agerton**, Nashville, Tenn.
 48,965. Clock-icing. **F. Boyle**, assignor to United States Rubber Co.—both of New York City.
 48,972. Comb. **G. D. Harper**, Minneapolis, Minn.
 48,981. Tire tread. **W. D. McNaull**, assignor to The McNaull Auto Tire Co.—both of Toledo, Ohio.
 48,991. Automobile tire. **W. A. Robbins**, Glen Ridge, N. J.
 49,211. Resilient tire. **H. H. Hewitt**, Buffalo, N. Y.
 49,213. Rubber tire. **V. P. Jackson**, assignor to Globe Rubber Tire Manufacturing Co., Inc.—both of Trenton, N. J.
 49,283. Rubber tire. **M. W. Roe**, assignor to The McGraw Tire & Rubber Co.—both of East Palestine, Ohio.
 49,296. Tire tread. **O. Blumhardt**, New York City.

HOW SHOULD RUBBER BE SOLD?

UNDER this title our English contemporary, "The India Rubber Journal," publishes a very interesting and timely article by W. F. de Bois Maclaren, the well-known rubber plantation agent.

After reviewing the situation of the crude rubber market in England and on the continent of Europe before the war, and comparing it with present conditions, Mr. Maclaren proposes forward sales contracts, on a sliding scale plan, as a means of protecting producers from too low returns for their rubber.

Prior to the war most of the crude rubber marketed in England was sold at public auctions, where, according to Mr. Maclaren, it was recklessly sacrificed at the rate of as many lots per minute as possible, for whatever bids rubber dealers chose to offer. Rarely was there any strong competition to secure lots.

On the Continent, sales were chiefly made by sealed tenders, the highest bidder always being declared the purchaser. This means of sale was always strongly opposed by rubber brokers in England, who maintained that the public auction was best in the interests of the owners as well as most convenient for buyers. To this system Mr. Maclaren lays the fact that last latex rubber was sold as low as 1s. 10d. [44 cents] per pound in London in 1913.

When the war came, public auctions had to be abandoned and sales by negotiation through brokers took their place. These sales have been recognized to be so much more satisfactory in their results that it is not likely that the auctions will ever again be revived.

Mr. Maclaren holds that the rubber plantation industry is, however, still too largely at the mercy of dealers and speculators in rubber, which fact, he claims, is to a large extent concealed by the extraordinary demand for rubber in the United States and the increased consumption in England. Given a period of

temporarily restricted trade, together with large and increasing arrivals of crude rubber, the same conditions would be repeated, unfavorable to the rubber planters.

SALES BY FORWARD CONTRACT.

As a remedy against this, Mr. Maclaren proposes the development and popularizing of the system of selling forward. He argues that:

Sales by forward contract are not new in the crude rubber trade, and they have done much for the rubber plantation industry. The chief benefit derived from such forward sales is that the amount of unsold rubber arriving on the market at any one time is restricted, and thus the demand for what is left is stronger than it otherwise would be. The larger the unsold tonnage on the market at any time, the greater the opportunity of the dealers and speculators to make large profits at the expense of the producers by breaking down the price.

RISKS OF FORWARD SALES.

Directors and commercial agents of rubber companies are not always ready sellers. Quite a large number of rubber companies sell no rubber forward and many others sell only the most meager portions of their total output. Yet these companies derive benefits from the sales made by the more public-spirited companies, and on occasion are able to boast that they have obtained a higher average price for their crops. The rubber market is so speculative that no one, however intelligent or well informed, can forecast its course with certainty. A forward sale, while insuring a certain profit on the portion of the crop sold, may be the means of depriving the company of a further considerable profit which it would otherwise have obtained.

Another aspect of the case is that it is sometimes the buyer forward who suffers severely.

PROPOSES SLIDING SCALE.

To the end that neither the seller nor the buyer be heavily penalized as the result of having entered into a forward sale contract, Mr. Maclaren proposes the adoption of a sliding scale in all such contracts. He takes a supposititious case as example:

A enters into a contract to sell forward to *B* three tons of crude rubber per month during a period extending from January to December, 1917, at 3s. 2d. per pound. In this supposed case one of two things is likely to happen. The market price may rise considerably and the seller regret the sale or, on the other hand, it might fall considerably and the purchaser suffer heavily financially on account of his purchase. In either case the result is more or less bad from the point of view of those interested in maintaining sound market conditions. With a sliding scale clause, such as is frequently inserted in forward sale contracts for very large amounts in the base metal trade, this would not have happened.

The working out of this supposititious contract the writer explains as follows:

Let it be imagined that during 1917 an average price of 4s. 2d. instead of 3s. 2d. ruled for first grade latex rubber. In this case, instead of suffering an apparent loss of one shilling per pound on 36 tons sold forward, of which amount the market was relieved, half of the rise would be paid to the seller who had assisted in bringing about the improved market condition. The seller would thus get an average price of 3s. 8d. per pound. Or, on the other hand, if there was a heavy fall in the price of rubber and the average for the year was 2s. 2d. instead of 3s. 2d.—the rate at which the forward contract was made—the loss would be shared. Instead of 3s. 2d., the seller would receive an average price of 2s. 8d., which would be 6d. more per pound than the average price for the year.

Mr. Maclaren argues that both the buyers and the sellers would run far smaller risks under such contracts than they do under present conditions, and consequently would be disposed to transact the bulk of their business on these safe, conservative lines. Further, the reduced quantities of spot rubber that would be on sale at any period would prevent dealers and speculators from making profits that are detrimental to the crude rubber producer. The result would be more stable market conditions and probably generally higher prices.

Review of the Crude Rubber Market.

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NEW YORK.

It Can be said in general that the market conditions which have prevailed during July were decidedly quiet. There has been, however, a fair demand and considerable inquiry with the principal interest centered in plantation futures for delivery during the coming year. Spot plantations have been scarce with prices ruling higher than quotations on forward positions for next year. The arrival of about 800 tons at San Francisco, last month, is the record for that port; however, Seattle is still the principal port of entry for eastern shipments via the Pacific coast.

Upriver fine was still high as compared to First latex and has maintained a generally firm position throughout the month, but an easier tendency was noticed during the closing week. Supplies of this particular grade are scarce, but it is too early for the market to feel the effects of the new crop that is not due to arrive until November. The other Para grades were fairly plentiful at normal prices.

During the last week of the month the cables from London announced a sharp advance and the New York Market responded accordingly by promptly advancing. This was primarily due to the reports of heavy buying in the eastern markets and rumors of large orders being placed in London for Russian account. This movement has the appearance of only a temporary flurry, and that it will subside as soon as the dealers have covered their requirements, is freely predicted.

The market was fairly steady with firm prices early in the month, but the heavy arrivals in London reported later caused prices to break sharply. On July 5, First latex spot and July-December were quoted 58 cents. Ribbed was 57 cents for both spot and futures while Upriver fine sold for 68 cents for spot and July-December deliveries. Prices for plantations continued unchanged, with minor fluctuations. Smoked sheet ribbed holding about a cent lower than First latex until the middle of the month when only a difference of one half cent was noted. The advance occurred on July 26, when First latex spot was quoted 59½ cents, buyers 58½ to 59 cents and Smoked sheet ribbed spot was 59½ cents. Upriver fine spot was scarce at 67 cents, and forward positions were held at 65 cents. The medium grades were normal, with the exception of Islands fine spot that was quoted 56½ cents and Islands coarse spot at 26½ cents. An easier tendency was noticed in all Para grades during the last week of the month.

The arrivals at New York, July 1-19, were approximately 3,350 tons compared to 5,635 tons for about the same period in June. They were as follows: Plantations from London and Liverpool, 1,300 tons; Colombo, 300 tons; Singapore, 80 tons; Seattle 760 tons; Para rubber from Brazil, 800 tons; from Europe, 80 tons; Centrals, 50 tons; Guayule, 58 tons; African, 17 tons and Manicoba, 85 tons.

LONDON.

The London market has been generally quiet and uneventful, with little to record other than the possible causes of the sharp advance that occurred late in the month, which has been already mentioned. On July 1, First latex spot was 56 cents and Smoked sheet ribbed spot, 55.5 cents. These prices continued during the month with slight variations until July 28, when First latex spot was quoted 55 cents and ribbed spot 54.5 cents. London crude rubber arrivals during June were approximately 4,000 tons. Liverpool arrivals for the same period were 1,000 tons.

SINGAPORE.

There were 967 tons sold at the four auctions held on July

7, 13, 20 and 27. Crêpe brought an average of 53.2 cents and Smoked sheet, 52.1 cents. Good demand and an active market were reported at the last auction.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and July 29, the current date:

Para.	August 1, 1915.	July 1, 1916.	July 29, 1916.
Upriver, fine, new.....	60 @ 60½	65 @ 66	66½ @
Upriver, fine, old.....	61 @ 63	66 @	68 @
Islands, fine, new.....	51½ @ 52	57 @	59 @
Islands, fine, old.....	55 @ 56	58 @	60 @
Upriver, coarse, new.....	44 @	41½ @ 42	40½ @
Upriver, coarse, old.....	44 @	41½ @ 42	40½ @
Islands, coarse, new.....	28 @	26 @	28½ @
Islands, coarse, old.....	31 @	26 @	28½ @
Cameta.....	31 @	32 @	32 @
Cancho, ball, upper.....	45½ @	42 @	41 @
Cancho, ball, lower.....	43 @	40 @	36 @
Plantations.			
First latex crêpe.....	{ Spot... 63 @	{ Spot... 60 @	58 @
	{ Adv'd 62½ @	{ Futures 60 @	58 @
Ambier crêpe, light.....	{ Spot... 58½ @	{ Futures 58½ @	56 @
Brown crêpe, clean.....	{ Spot... 56½ @	{ Futures 56½ @	54 @
			52½ @
Smoked sheet,			
ribbed.....	{ Spot... 62 @	{ Spot... 59 @	57½ @
	{ Adv'd 61½ @	{ Futures 59 @	57 @
Fine sheets and biscuits,			
unsmoked.....	60 @		
Centrals.			
Corinto.....	43½ @	40 @	41 @
Esmeralda, sausage.....	42½ @	40 @	40 @
Nicaragua, scrap.....	42 @	40 @	39 @
Mexican plantation,			
sheet.....			
Mexican, scrap.....	42½ @	39 @	
Mexican, slab.....		32 @	28 @ 30
Mangabera.....	37 @ 38	42½ @	42½ @
Mangabera, sheet.....	38 @	40 @	40 @
Guayule.....	34 @ 35	36 @	35 @
Balta, sheet.....	55 @ 56	74 @	72½ @
Balta, block.....	47 @ 48	55 @	41 @
Africans.			
Lopori, ball, prime.....	53 @ 54	58 @	53 @
Lopori, strip, prime.....			
Upper Congo, ball, red.....		53 @ 55	52 @
Rio Nunez, Niggers.....	55 @	54 @	53 @
Comakey Niggers.....	53 @	50 @ 52	53 @
Masani, red.....	52 @ 53	56 @	51 @
Soudan, Niggers.....		48 @ 52	
Cameron, ball, soft.....		41 @ 51	
Cameron, ball, hard.....			
Benguela, No. 1.....	33 @	42 @	36½ @
Benguela, No. 2.....		35 @	35 @
Acacia, flake.....	22½ @	28 @	33 @
East Indian.			
Assam, block.....	44 @ 48		40 @
Pontianak.....	7½ @	8½ @	8 @
Gutta Siam.....	12½ @ 14	14½ @	18 @ 19
Gutta red Nigger.....		23 @	24 @ 25
Borneo III.....		18 @ 20	
Gutta Percha.....	50 @ 1.50	1.50 @ 2.50	1.50 @ 2.50

MARKET CABLE SERVICE FROM SINGAPORE.

The following reports of the weekly auctions held at Singapore have been cabled by The Waterhouse Co., Limited:

Date.	Crêpe.	Smoked Sheet.	Pounds Sold.	Market.
July 7.....	52.2	51.8	739,200	Active, same prices.
July 13.....	54.8	53.1	560,000	Duller.
July 20.....	53.4	51.0	636,160	Firmer, more inquiry.
July 27.....	52.7	52.7	846,720	Active, good demand.

COMPARATIVE NEW YORK PRICES FOR JULY.

The demand for Commercial paper still continues quite good, though not as large this month as previously, and the best rubber names are now quoted about 4 1/2% to 5% per cent, and those not so well known 5 1/2% per cent.

	1916.*	1915.	1914.
Upriver, fine	\$0.65 @ 0.68	\$0.59 @ 0.63	\$0.68 @ 0.75
Upriver, coarse	41 @ .42	44 @ .47	40 @ .42
Islands, fine	.58 @ .59	.52 @ .54	.57 @ .60
Islands, coarse	.26 @ .28	.28 @ .30	.27 @ .30
Cameta	.33 @ .34	.31 @ .32	.30 @ .34

*Figured only to July 26.

SINGAPORE.

GUTHRIE & CO., LIMITED, report [July 16, 1916]:

At the continuation of the auction today demand was slow and values suffered a further decline. The top price paid was \$128, one parcel of standard crepe fetching this figure. Standard sheet sold up to \$126.

All other grades were from \$2 to \$5 lower than yesterday's levels.

Of the quantity cataloged some 300 tons changed hands.

The following was the course of values:

	In Singapore per picul.*	Sterling equivalent per pound in London.	Equivalent per pound in cents.†
Sheet, fine ribbed smoked...	\$122 @ 129	2/ 5 1/2 @ 2/ 6 1/2	59.04 @ 62.08
Sheet, good ribbed smoked...	117 @ 123	2/ 4 1/2 @ 2/ 5 1/2	57.01 @ 59.54
Sheet, plain smoked...	118 @ 123	2/ 4 1/2 @ 2/ 5 1/2	57.27 @ 59.54
Sheet, ribbed unsmoked...	117 @ 124	2/ 4 1/2 @ 2/ 5 1/2	57.01 @ 59.80
Sheet, plain unsmoked...	115 @ 127	2/ 3 3/4 @ 2/ 5 1/2	56.00 @ 61.06
Crepe, fine pale...	128 @ 130	2/ 6 1/2 @ 2/ 6 1/2	61.57 @ 62.33
Crepe, good pale...	122 @ 128	2/ 5 1/2 @ 2/ 6 1/2	59.04 @ 61.57
Crepe, fine brown...	120 @ 125	2/ 4 1/2 @ 2/ 5 1/2	58.28 @ 60.31
Crepe, good brown...	110 @ 119	2/ 3 1/2 @ 2/ 4 1/2	53.46 @ 57.77
Crepe, dark...	90 @ 114	1/ 10 1/4 @ 2/ 2 1/2	45.35 @ 52.37
Crepe, bark...	70 @ 94	1/ 6 1/4 @ 1/ 11 1/4	36.99 @ 47.13
Scrap, virgin...	83 @ 101	1/ 9 @ 2/ 0 1/4	42.57 @ 50.17
Scrap, pressed...	55 @ 88	1/ 3 @ 1/ 10	30.41 @ 44.60
Scrap, loose...	53 @ 85	1/ 2 1/2 @ 1/ 9 3/4	30.15 @ 43.33

*Picul = 133 1/2 pounds.

†Figured at standard rate of exchange, 1s. = 24.3 cents.

Quoted in S. S. dollars = 2/4 [56.7 cents].

CRUDE RUBBER ARRIVALS AT THE PORT OF NEW YORK.

[The Figures Indicate Weights in Pounds.]

JUNE 19.—By the steamer *Rio de Janeiro* from Pará and Manaós:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Meyer & Brown	27,190	1,100	14,000	28,000	70,290
H. A. Aslett & Co.	57,400	5,300	27,000	71,200	161,500
H. C. Kupper	109,800	800	500	2,100	112,400
Arnold & Zeiss	75,200	5,500	29,200	...	109,900
G. Amsinck & Co.	27,100	800	10,200	...	38,100
A. D. Straus & Co.	54,700	...	...	...	54,700
Henderson & Korn	700	3,600	17,200	17,300	38,800
Pell & Dumont	31,600	3,080	...	...	34,680
Neuss & Hesselein	19,300	...	4,000	100	23,600
Hagemeyer & Brunn	8,200	3,000	4,200	2,300	17,700
W. R. Grace & Co.	700	100	4,500	1,900	6,200
Various	80,900	200	5,900	42,300	129,300
Totals	492,800	23,300	118,300	223,600	858,000

JUNE 30.—By the steamer *Minas Geraes* from Pará and Manaós:

	61,900	4,300	25,500	2,800	94,500
Meyer & Brown	61,900	4,300	25,500	2,800	94,500
Henderson & Korn	43,200	3,700	3,500	...	52,100
J. T. Johnstone & Co.	...	22,000	23,800	45,800	...
G. Amsinck & Co.	...	11,200	31,000	44,000	...
Bertuch	23,500	3,500	11,100	200	38,300
Arnold & Zeiss	...	11,300	20,000	31,300	...
Hagemeyer & Brunn	6,400	300	1,000	13,700	21,400
W. R. Grace & Co.	10,200	...	...	...	10,200
H. A. Aslett & Co.	3,200	4,300	...	...	7,500
Totals	150,900	18,500	112,400	138,300	420,100

JULY 3.—By the steamer *Stephen* from Pará and Manaós:

Meyer & Brown.....	73,400	6,600	43,900	46,500	170,400
Arnold & Zeiss.....	79,000	8,300	55,700	10,700	153,700
Robinson & Co.....	52,200	6,500	27,500	33,800	120,000
H. A. Aslett & Co.....	22,800	17,000	41,100	2,400	83,300
Pell & Dumont.....	34,200	2,800	11,200	.....	48,200
W. R. Grace & Co.....	27,700	700	2,300	21,200	45,800
Paul Bertuch.....	26,400	4,900	300	.....	31,600
Henderson & Korn.....	2,600	.....	1,100	25,600	29,300
Aldens' Successors, Ltd.....	400	1,800	5,400	.....	7,600
Totals.....	312,700	48,900	188,400	140,200	690,200

JULY 17.—By the steamer *Boniface* from Pará:

Meyer & Brown.....	32,600	3,700	38,000	39,500=	113,800
Arnold & Zeiss	62,100	6,600	50,700	11,900=	131,300
H. A. Astlett & Co.	27,100	1,800	6,600	32,000=	67,500
Paul Bertuch	34,500	.....	10,000	10,700=	55,200
Henderson & Korn .....	.....	7,500	29,700	.....=	37,200
G. Amsinck & Co.	7,900	400	8,600	.....=	16,900

JULY 18.—By the steamer *Sao Paulo* from Pará and Manaós:

Meyer & Brown	33,800	2,100	31,700	94,600	162,200
Arnold & Zeiss	59,800	5,100	51,600	19,000	144,500
H. A. Aslett & Co.	19,400	14,600	8,100	25,200	67,300
Henderson & Korn	18,200	1,400	24,800		44,400
Robinson & Co.	17,100	1,700		11,400	30,200
Pell & Dumont			4,700	11,100	15,800
J. T. Johnstone & Co.	11,100	700			11,800
G. Amsinck & Co.	5,000		3,200		8,200
Raw Products Co.				8,100	8,100
Lazard Freres	6,300				6,300
Paul Bertuch	700				700

PARAS.

POUNDS.

	POUNDS.
JUNE 26.—By the <i>Ancon</i> —Colon:	
G. Amsinck & Co. (Fine).....	40,500
G. Amsinck & Co. (Coarse).....	5,000
W. R. Grace & Co. (Caucho).....	11,000
Totals	53,500
JUNE 28.—By the <i>Ulysses</i> —Colon:	
G. Amsinck & Co. (Fine).....	17,000
G. Amsinck & Co. (Coarse).....	1,000
W. R. Grace & Co. (Fine).....	6,000
Totals	24,000

JUNE 30.—By the *Californian*—Montevideo:

A. D. Straus & Co. (Fine).....	20,000
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JULY 10.—By the <i>Caracas</i> —Puerto Cabello:	
R. Fabien & Co. (Fine).....	9,000
R. Fabien & Co. (Coarse).....	3,000
General Export & Commission Co. (Fine).....	5,000
General Export & Commission Co. (Coarse).....	2,000
Totals	19,000

JULY 12.—By the *Cristobal*—Colon:

G. Amsinck & Co. (Fine).....	25,000
G. Amsinck & Co. (Coarse).....	4,000
Neuss, Hesselein & Co. (Fine).....	14,000
Neuss, Hesselein & Co. (Coarse).....	3,000
Muller, Schall & Co. (Caucho).....	11,700
W. R. Grace & Co. (Fine).....	8,500
Totals	66,200

JULY 12.—By the *Alliance*—Colon:

W. R. Grace & Co. (Fine).....	4,000
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JULY 13.—By the *Nordwester*—Montevideo:

Neuss, Hesselein & Co. (Fine).....	2,500
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POUNDS.

	POUNDS.
JULY 15.—By the <i>Maraval</i> —Ciudad Bolívar:	
Yglesias, Lobo & Co. (Fine).....	25,000
Yglesias, Lobo & Co. (Coarse).....	10,000
R. Fabien & Co. (Fine).....	25,000
R. Fabien & Co. (Coarse).....	5,000
Totals	65,000

CENTRALS.

[This sign, in connection with imports of Centra's, denotes Guayule rubber.]

JUNE 22.—By the *Proteus*—New Orleans:

G. Amsinck & Co.	20,000
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JUNE 23.—By the *El Siglo*—Galveston:

Various	45,000
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JUNE 26.—By the *Esperanza*—Mexico:

Graham, Hincley & Co.	1,000
H. Marquardt & Co.	1,000
G. Schaumann & Co.	5,000
Totals	7,000

JUNE 27.—By the *Guantanamo*—Tampico:

C. Tennant, Sons & Co.	100,000
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JUNE 26.—By the *Ancon*—Colon:

G. Amsinck & Co.	20,300
Muller, Schall & Co.	1,400
Goldsmith & Co.	16,200
Charles F. Griffin	1,000
A. M. Capen's Sons	1,000
Lazard Freres	2,000
Howard & Co.	2,000
Meyer Hecht	1,200
Silvia Business & Co.	2,000
Amerson Trading Co.	10,200
Mecke & Co.	2,200

POUNDS.

H. Wolff & Co.	1,000
Fidanek Bros. & Co.	1,200
Various	5,500
Totals	65,300

JUNE 26.—By the *Suzanna*—Puerto Cortez:

A. Rosenthal & Sons	4,000
Roederer & Litzel	300
Republic Rubber Co.	300
Eggers & Heinlein	300
W. R. Grace & Co.	400
J. S. Sembrala & Co.	500
W. H. Knox	500
Totals	7,400

JUNE 26.—By the *Tenador*—Port Limon:

A. A. Linde & Co.	700
Isaac Brandon & Bros.	300
H. Marquardt & Co.	200
Gontard & Co.	200
Totals	1,400

JUNE 27.—By the *Guantanamo*—Mexico:

J. A. Medina & Co.	1,000
Graham, Hincley & Co.	500
General Export & Commission Co.	2,000
Various	3,500
Totals	5,200

JUNE 28.—By the *Ulysses*—Colon:

G. Amsinck & Co.	27,000
A. M. Capen's Sons	12,000
Lauman & Kemp	2,700
R. G. Barthold & Co.	1,300
Gontard & Co.	2,000
Hartberger & Stack	300
Silvia Business & Co.	2,000
H. Mann & Co.	1,000
J. S. Sembrala & Co.	2,200
Pablo, Calvert & Co.	2,500
Camacho, Keldan & Van Sickle.	6,300
H. Wolff & Co.	1,400
Totals	59,200

JUNE 30.—By the *Santa Marta*=Cartagena.
Andean Trading Co. 2,000

JULY 3.—By the *Cometa*=Cartagena.
G. Amisack & Co. 3,000
Potberg, Ebeling & Co. 400
H. A. Held 400
JULY 3.—By the *Monarca*=Port Limerick.
Isaac Brandon & Bros. 1,400

JULY 5.—By the *Panama*=Colon:
Lawrence Johnson & Co. 2,500
American Trading Co. 1,000

JULY 6.—By the *Narciso*=Cartagena.
Andean Trading Co. 4,500

JULY 6.—By the *B. George*=Cartagena.
Potberg, Ebeling & Co. 4,000
A. Held 3,000

JULY 6.—By the *Isabellita*=Cartagena.
Crowley & Co. 1,500
H. Marquardt & Co. 500

JULY 10.—By the *Francisco*=Cartagena.
A. Rosenthal & Sons. 5,500
M. C. Keith. 1,000
Eggers & Heinlein. 500

JULY 10.—By the *Monarca*=Mexico:
Graham, Hinkley & Co. 8,000
American Trading Co. 6,000
G. Amisack & Co. 1,000

JULY 10.—By the *Monterey*=Tampico:
C. Tennant Sons & Co. 15,000

JULY 11.—By the *Pastores*=Bocas del Toro:
Crowley & Co. 2,500
A. A. Linde & Co. 1,000
Isaac Brandon & Bros. 300
H. Marquardt & Co. 500

JULY 11.—By the *P. George*=Cartagena:
Various. 43,500

JULY 12.—By the *Carpathia*=Cartagena:
G. Amisack & Co. 7,500
Otto Gerdan & Co. 3,500
Lawrence Johnson & Co. 2,000
A. Held. 400
J. S. Sembrado & Co. 12,000
Isaac Brandon & Bros. 2,000
Various. 5,500

JULY 12.—By the *Isabellita*=Cartagena:
G. Amisack & Co. 7,500
Lazare Freres. 4,000
Mecke & Co. 2,800
Harburger & Stack. 700
H. Mann & Co. 400

JULY 13.—By the *Zacapa*=Cartagena:
G. Amisack & Co. 4,000
Hills Bros. & Co. 1,000

JULY 14.—By the *El Occidente*=Galveston:
Various. 33,500

JULY 15.—By the *Admiral Sebille*=Mexico:
Graham, Hinkley & Co. 2,000
Various. 2,500

JULY 19.—By the *T. Mar*=Galveston:
Various. 11,000

JULY 19.—By the *El Sud*=Galveston:
Various. 14,800

AFRICANA.

JUNE 27.—By the *P. George*=Cartagena:
General Rubber Co. 135,000
K. Schroeder. 9,000
Various. 7,500

JUNE 22.—By the *Idaho*=Hull:
Arnold & Zeiss. 2,200

JUNE 23.—By the *Carpathia*=Liverpool:
Arnold & Zeiss. 56,000
Goodyear Tire & Rubber Co. 33,500
F. Stern & Co. 18,000
Rubber Trading Co. 2,200

JUNE 27.—By the *Patroclus*=Batavia:
Karl Schroeder. 60,000

JUNE 27.—By the *Gallop*=Hull:
E. J. Curry. 15,000

JULY 30.—By the *Queen Margaret*=Liverpool:
The B. F. Goodrich Co. 3,000
Goodyear Tire & Rubber Co. 11,200

JULY 3.—By the *Orduna*=Liverpool:
Arnold & Zeiss. 6,000
F. Stern & Co. 2,000

JULY 12.—By the *St. George*=Liverpool:
Arnold & Zeiss. 500
Sweetstart Tire & Rubber Co. 2,500

JULY 17.—By the *Finland*=Liverpool:
F. Stern & Co. 1,000

MANICOBIA.

JUNE 8.—By the *Monarca*=Batavia:
Adolph Hirsch & Co. 11,000
G. Amisack & Co. 14,500

JULY 3.—By the *Eastern Prince*=Batavia:
Adolph Hirsch & Co. 35,000
Various. 7,000

JULY 3.—By the *Eastern Prince*=Rio de Janeiro:
G. Amisack & Co. 33,500

JULY 11.—By the *Strabo*=Batavia:
Adolph Hirsch & Co. 67,000

JULY 17.—By the *Monarca*=Batavia:
Rosbach Bros. & Co. 7,500
G. Amisack & Co. 4,500

JULY 17.—By the *Boniface*=Ceara:
Adolph Hirsch & Co. 5,500

JULY 19.—By the *St. Paul*=Batavia:
Lawrence Johnson & Co. 8,000
Blumenthal & Co. 2,500

PLANTATIONS.

JUNE 22.—By the *Rotti*=Batavia:
Meyer & Brown. 120,000
Edward Maurer & Co., Inc. 150,000

JULY 3.—By the *Almanca*=London:
L. Littlejohn & Co. 113,628
I. T. Johnstone & Co. 88,300

JULY 3.—By the *Almanca*=London:
Henderson & Korn. 10,000
General Rubber Co. 33,500

JULY 3.—By the *Almanca*=London:
F. H. Cone. 160,000
C. Richard & Co. 160,000
Manhattan Rubber Manufacturing Co. 22,500

JULY 3.—By the *Almanca*=London:
Hirsch & Co. 30,000
Rubber Trading Co. 25,000
E. Millenbach & Co. 10,000
Goodyear Tire & Rubber Co. 8,000
Various. 60,000 1,157,628

JUNE 22.—By the *Port Nicholson*=London:
Meyer & Brown. 22,500
Edward Maurer & Co. 38,000

JULY 3.—By the *Almanca*=London:
The B. F. Goodrich Co. 370,000
Robinson & Co. 9,000
Charles Wilson Co., Inc. 110,000
Arnold & Zeiss. 120,000

JULY 23.—By the *Carpathia*=Liverpool:
The B. F. Goodrich Co. 22,500
General Rubber Co. 2,200

JULY 23.—By the *Carpathia*=Liverpool:
Meyer & Brown. 67,000
L. Littlejohn & Co. 66,750

JULY 23.—By the *Carpathia*=Liverpool:
Goodyear Tire & Rubber Co. 35,500
Henderson & Korn. 11,200

JULY 23.—By the *Carpathia*=Liverpool:
I. T. Johnstone & Co. 30,600
Edward Maurer & Co., Inc. 60,000
Arnold & Zeiss. 80,000
Various. 7,500

JULY 24.—By the *City of Manchester*=Colombo:
Meyer & Brown. 112,000
I. T. Johnstone & Co. 10,000

JULY 24.—By the *City of Manchester*=Colombo:
Edward Maurer & Co., Inc. 9,000
Arnold & Zeiss. 11,200
L. Littlejohn & Co. 46,320

JULY 26.—By the *Indana*=London:
Meyer & Brown. 9,000
General Rubber Co. 310,000
Arnold & Zeiss. 150,000

JULY 26.—By the *Indana*=London:
I. T. Johnstone & Co. 73,000
Robinson & Co. 35,500
Aldens' Successors, Ltd. 21,900

JULY 26.—By the *Indana*=London:
Charles T. Wilson Co., Inc. 7,000
Edward Maurer & Co., Inc. 5,000

JULY 26.—By the *Philadelphian*=London:
Michigan Tire Co. 90,000
L. Littlejohn & Co. 44,595
F. Stern & Co. 35,000
Rubber Trading Co. 11,200

JULY 27.—By the *Patroclus*=Batavia:
Meyer & Brown. 21,000
Michigan Tire Co., Inc. 336,000

JULY 27.—By the *Patroclus*=Batavia:
General Rubber Co. 22,500
G. Amisack & Co. 100,000
Manhattan Rubber Manufacturing Co. 30,000

JULY 27.—By the *Patroclus*=Batavia:
I. T. Johnstone & Co. 40,200
W. R. Grace & Co. 95,000
Henderson & Korn. 45,000

JULY 27.—By the *Patroclus*=Batavia:
Goodyear Tire & Rubber Co. 95,000
L. Littlejohn & Co. 112,775
Rubber Trading Co. 95,000
Various. 125,000 1,236,575

JULY 3.—By the *Manila*=London:
Charles T. Wilson Co., Inc. 115,000
General Rubber Co. 100,000
L. Littlejohn & Co. 196,250
F. Stern & Co. 25,000
Rubber Trading Co. 6,000

JUNE 28.—By the *Michigan*=London:
Meyer & Brown. 50,000
Raw Products Co. 25,500
Goodyear Tire & Rubber Co. 22,500

JUNE 30.—By the *Queen Margaret*=Liverpool:
The B. F. Goodrich Co. 9,000
General Rubber Co. 4,500

JULY 3.—By the *Finland*=London:
Meyer & Brown. 50,000
The B. F. Goodrich Co. 600,000
I. T. Johnstone & Co. 75,000
Michigan Tire Co. 56,000
Edward Maurer & Co., Inc. 22,500

JULY 3.—By the *Finland*=London:
The B. F. Goodrich Co. 10,000
Arnold & Zeiss. 45,000
E. J. Curry. 45,000
F. Stern & Co. 25,000

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Arnold & Zeiss. 45,000
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E. J. Curry. 45,000
F. Stern & Co. 25,000

JULY 3.—By the *Finland*=London:
The B. F. Goodrich Co. 10,000
Arnold & Zeiss. 45,000
E. J. Curry. 45,000
F. Stern & Co. 25,000

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CRUDE RUBBER ARRIVALS AT SEATTLE.

(This figure includes quantities in pounds.)

PLANTATION.

TO AKRON.

By the steamer *Carla* M. P. 1,000

British Consular General. 10,400

POUNDS.			POUNDS.			POUNDS.		
TO NEW YORK.			GUTTA JELUTONG.			PORT OF BOSTON—JUNE, 1916.		
Henderson & Kohn	74,620	80,210	TO SEATTLE.			Imports:		
International Trading Co.	5,590		July 3.—By the steamer <i>Titan</i> , Dexter-Horton National Bank.			India rubber	313,766	\$208,935
TO SEATTLE.			July 8.—By the steamer <i>Gishun Maru</i> .			Gutta jelutong (Pontianak)	658,295	29,668
British Consul General.			L. Littlejohn & Co.	551,20		Gutta percha	76,245	8,263
Guthrie & Co.	6,110		Paterson, Simons & Co.	105,170		Manufactures of india rubber	4,447	690
TO SEATTLE.			Adamson, Gelfellow & Co.	44,980		Totals	1,053,300	\$255,696
June 29.—By the steamer <i>Indra Maru</i> , Nippon Yusen Kaisha.	7,540		Huttenbach Bros. & Co.	6,370	211,640	EXPORTS:		
TO AKRON.			TO SEATTLE.			India rubber boots	21,392	\$43,215
July 3.—By the steamer <i>Titan</i> .			July 20.—By the steamer <i>Banroku Maru</i> .			India rubber shoes	91,326	37,768
J. T. Johnstone & Co.	9,100		L. Littlejohn & Co.	204,750		Rubber scrap	4,447	690
Planters Stores & Agency Co.	2,470		Paterson, Simons & Co.	11,180	215,930	Automobile tires	156,124	
Goodyear Tire & Rubber Co.	121,290		Jaeger & Co.	21,450		Other rubber tires	25	
Marrisons & Crossfield	53,820		GUTTA PERCHA.			Belting, hose, etc.	49,734	
Anglo-Malay Rubber Co.	17,030	203,710	July 8.—By the steamer <i>Gishun Maru</i> .			All other manufactures of rubber	83,257	
Duff Development Co.			L. Littlejohn & Co.	21,450		Total		\$370,813
TO NEW YORK.			Katz Bros.	21,450		PORT OF CHICAGO—JUNE, 1916.		
United States Rubber Co.	198,380		TO SEATTLE.			Imports:		
General Rubber Co.	44,460		July 20.—By the steamer <i>Banroku Maru</i> .			Gutta jelutong (Pontianak)		\$1,610
International Trading Co.	8,320		L. Littlejohn & Co.	15,340		PORT OF CLEVELAND—JUNE, 1916.		
J. T. Johnstone & Co.	34,320		Katz Bros.	25,610		Imports:		
C. W. Mackie & Co.	20,020		GUTTA SIAK.			India rubber	329,530	\$241,822
Fox & Co.	47,450		July 20.—By the steamer <i>Banroku Maru</i> .			Manufactures of india rubber	2,990	
Weller & Co.	29,120		L. Littlejohn & Co.			Totals	329,530	\$234,812
C. W. Mackie & Co.	2,470	384,540	Katz Bros.			PORT OF GILVERSON—JUNE, 1916.		
Arthur Meyer & Co.			CUSTOM HOUSE STATISTICS.			Imports:		
Inch Kenneth Rubber Estate.			PORT OF DETROIT—MAY, 1916.			Manufactures of india rubber		\$15
TO SEATTLE.			Imports:	Pounds.	Value.	PORT OF NEW ORLEANS—JUNE, 1916.		
Cumbebatch & Co.	11,310		Rubber scrap	15,950	\$136	India rubber	17,693	\$6,203
Guthrie & Co.	6,240		Exports:			PORT OF PHILADELPHIA—JUNE, 1916.		
R. I. Ried & Co.	4,810		Rubber scrap	6,458	\$491	Imports:		
George Stewart & Co.	2,470		Reclaimed rubber	87,719	10,324	Beltling, hose, etc.		\$4,193
Sungei Puren Rubber Co.	2,470		Totals	94,167	\$10,815	PORT OF SAN FRANCISCO—JUNE, 1916.		
Cheras Rubber Estate.	2,470	33,540	PORT OF NEW YORK—MAY, 1916.			Imports:		
TO SAN FRANCISCO.			Imports:			India rubber	274,363	\$193,975
July 8.—By the steamer <i>Gishun Maru</i> .			India rubber	19,650,628	\$12,732,501	Gutta percha	960	52
W. R. Grace & Co.	45,500		Balata	75,062	33,855	Manufactures of india rubber		436
Sandilands, Buttery & Co.			Gutta jelutong (Pontianak)	308,797	19,035	Totals	274,733	\$194,463
TO AKRON.			Gutta percha	421,783	22,539	PORT OF SEATTLE—JUNE, 1916.		
July 20.—By the steamer <i>Manila Maru</i> .			Rubber scrap	986,950	64,544	Imports:		
The B. F. Goodrich Co.	67,470	86,060	Manufactures of gutta percha	20,500		India rubber	2,881,740	\$1,995,228
Goodyear Tire & Rubber Co.	18,590		Manufactures of india rubber	32,864		Gutta jelutong (Pontianak)	2,112,026	109,952
Rubber Estates of Johore.			Substitutes, elasticon, etc.	276		Gutta percha	246,762	29,242
TO SEATTLE.			Totals	21,443,320	\$12,926,114	Manufactures of india rubber		40
July 20.—By the steamer <i>Banroku Maru</i> .			Exports:			Totals	5,240,528	\$2,134,462
The B. F. Goodrich Co.	688,220		India rubber	22,628	\$16,744			
L. Littlejohn & Co.	70,460							
Paterson, Simons & Co.	11,050							
W. R. Grace & Co.	5,720	775,450						
Pennang Rubber Estates.								
Malaysia Rubber Co., Ltd.								

PLANTATION RUBBER FROM THE FAR EAST.

TOTAL EXPORTS FROM MALAYA.

(From January 1, 1916, to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	From Singapore.	From Malacca.	From Penang.	From Port Swettenham.	Totals.
United Kingdom	10,291,606	1,538,534	7,527,100	8,250,747	27,607,981
The Continent	4,888,537	20,667			4,909,203
France	1,349,479				1,349,479
Ceylon	76,894		225,466	605,248	907,608
United States	27,333,200		3,106,667		30,439,867
Australia	130,047				130,047
Totals	44,699,753	1,538,534	10,879,900	8,855,995	65,344,182

For same period, 1915 20,651,757 3,276,002 8,230,797 10,915,581 43,074,137
 For same period, 1914 12,167,677 1,772,527 5,598,000 10,860,277 30,198,476
 For same period, 1913 8,614,698 4,399,733 10,530,769 13,735,200

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram from Kuala Lumpur gives the figures of the export of plantation rubber from the Federated Malay States during the month of June as 5,114 tons against 3,956 tons in May last and 3,402 tons in the corresponding month last year. The total export for the six months of the current year amounted to 27,091 tons against 19,190 tons in 1915 and 13,650 tons in 1914. Appended are the comparative figures:

	1914.	1915.	1916.
January	2,542	3,473	4,471
February	2,364	3,411	5,207
March	2,418	3,418	4,429
April	2,151	2,777	3,914
May	2,069	2,798	3,956
June	2,306	4,403	5,114
Totals	13,850	19,190	27,091

STRAITS SETTLEMENTS RUBBER EXPORTS.

A cablegram from the Colonial Secretary, Singapore, notifies that the export of plantation rubber from Straits Settlements ports in the month of June amounted to 3,274 tons compared with 2,419 tons in April and 3,588 tons in the corresponding month last year. The total export for the first five months of the current year amounted to 19,776 tons against 13,360 tons in 1915 and 7,026 tons in 1914. Appended are the comparative statistics:

	1914.	1915.	1916.
January	1,781	2,576	4,443
February	1,103	2,741	3,359
March	1,285	1,481	4,240
April	1,548	1,978	4,219
May	1,309	3,588	3,274
Totals	7,026	13,360	19,776

These figures include transshipments of rubber from various places in the neighborhood of the Straits Settlements such as Java, Sumatra, Borneo and the non-Federated Malay States as well as rubber actually exported from the Colony, but do not include rubber exports from the Federated Malay States.

EXPORTS OF CEYLON RUBBER EXPORTS.

(From January 1 to June 1, 1915 and 1916. Compiled by the Ceylon Chamber of Commerce.)

To—	1915.	1916.
United States	5,084,644	12,172,076
Canada and Newfoundland	140,000	209,376
Russia	327,720	691,092
United Kingdom	11,672,419	179,010
Australia	168,081	8,302,419
India	500	407,451
Straits Settlements	119,933	628
Japan	183,739	130,516
Totals	18,106,752	21,919,039

(Same period 1914, 14,454,752 pounds; same period 1913, 9,675,521.) The

export figures of rubber, given in the above table for 1914, include the imports re-exported. (This amount to 1,478,849 pounds from the Straits Settlement and 265,600 pounds from India.) To arrive at the total quantity of Ceylon rubber exported for that year deduct these imports from the total exports. The figures for 1915 and 1916 are for Ceylon rubber only.

IMPORTS AND EXPORTS OF RUBBER AND GUTTA AT SINGAPORE.

IMPORTS.

May, 1916.					
From—	Para Rubber	Borneo	Gutta	Gutta	
Federated Malay States—	for	Rubber.	Percha.	Jelutong.	
Port Swettenham—pounds	Treatment.				
Teluk Anson	1,155,066				
Muar	721,600				
Kelantan	560,800	41,866			
Port Dickson	23,600				
Kuantan	35,466				
Belaga	87,133				
Kenat	8,133	5,866			
Merang	1,333	8,800			
Tringganu	133				
Totals	2,642,664	56,532			
Sumatra					
Diambi	168,666		3,066	20,000	
Banthermassin	38,800	56,303	5,600	100,533	127,200
Polembang	17,133		2,800	533	513,466
Pasir	15,866				
Belawan	14,800	118,266			
Ulaghiri	17,000				
Asahan	6,333	18,800			44,933
Muntok	4,000				
Suk	3,466				
Port Ben			2,133	3,733	75,733
Bengkalis			400		
Totals	279,997	193,369	10,933	107,865	781,332
Borneo—					
Sarawak	86,400	42,133		12,400	2,088,133
Pontianak	52,066	2,133	18,266	4,800	46,400
Pemabas	17,866		1,200	34,400	
Sibu	17,000		5,200	16,800	221,466
Sungayang	4,800		6,000	1,600	
Samarinda	2,400				
Totals	191,132	44,266	29,466	36,800	2,410,399

British North Borneo—					
Jessellton	34,533	195,866		5,533	
Labuan	25,000	1,200		7,866	369,600
Sandakan	12,400	33,200			
Kudat	5,200	19,866	133	800	
Totals	87,199	250,132	133	11,199	269,600
Straits Settlements—					
Malacca	572,800	703,300			
Penang	521,600	294,533			
S. Fongjang	400				
Totals	1,094,800	997,733			
Java—					
Batavia	155,466				
Sourabaya	54,133				
Del	40,666	693,600			
Totals	250,265	693,600			
Other Ports	231,466	33,600	26,400	48,800	181,466
Grand Totals	4,777,523	2,269,232	66,932	204,664	3,642,797

EXPORTS. May, 1916.

To—	Para Rubber	Borneo	Gutta	Gutta	
UNITED STATES—	Para Rubber	shipped.	Rubber.	Percha.	Jelutong.
Seattle	809,866	54,933		257,600	2,252,933
New York	736,533	182,933		124,400	219,200
Alton	693,466	252,266			
San Francisco	145,600	23,200			11,333
Canada—					
Ontario (Toronto)	128,000				
Vancouver	702,000				
Totals	3,205,465	513,332		382,000	2,483,466
EUROPE—					
England (London)	594,933	1,168,000		235,333	4,400
Russia (Vladivostok)	260,133				
France (Marseilles)	136,900	20,800	33,333		
Totals	991,966	1,188,800	33,333	235,333	4,400
Grand Totals	4,197,431	1,702,132	33,333	617,333	2,487,866

EXPORTS OF INDIA RUBBER FROM PARA AND MANAOS DURING JUNE, 1916.

EXPORTERS.	NEW YORK.					EUROPE.					Grand Totals.
	Fine.	Medium.	Coarse.	Caucho.	Totals.	Fine.	Medium.	Coarse.	Caucho.	Totals.	
J. Marques	1,968	3,868	22,687	58,478	87,001	21,920		13,262	10,720	45,902	132,003
Suter & Co.	30,688	2,396	21,987	10,985	65,056	5,280			40,260	45,540	111,596
General Rubber Co. of Brazil.	37,096	4,094	23,083	1,315	65,588	10,880	680			11,560	77,148
Fires Teixeira & Co.	26,950	1,678	38,177	11,341	68,146						68,146
Beninger & Co.	50,126				50,126						50,126
Selmann & Co.	15,227	38	2,677	28,159	46,101						46,101
G. Fradelizi & Co.	31,340	2,733	8,672	69	42,814						42,814
Adelbert H. Alden, Limited.	170	510	1,590		2,270	4,426			960	5,410	7,680
Sumitres	34,008	3,389	22,241	53,458	113,096	2,890	170		13,879	16,939	130,035
Totals	227,573	18,706	131,114	163,805	541,198	45,390	850	13,262	65,849	125,351	666,549
Exports from Itacatiara.						1,000	181	1,072	277	2,530	25,530
Exports from Manaoas.	229,842	24,212	77,227	73,015	404,296	50,958	60,676	9,035	228,956	349,625	733,251
Totals	457,415	42,918	208,341	236,820	945,494	97,348	61,707	23,369	295,081	477,506	1,423,300

(Compiled by Suter & Co., Para.)

EXPORTS OF INDIA RUBBER FROM MANAOS DURING MAY, 1916.

EXPORTERS.	NEW YORK.					EUROPE.					Grand Totals.
	Fine.	Medium.	Coarse.	Caucho.	Totals.	Fine.	Medium.	Coarse.	Caucho.	Totals.	
Suter & Co.	72,768	7,104	30,841	15,413	136,126	1,700	480	170	38,400	40,750	166,876
Tancredi Porto & Co.	79,546	28,639	30,082	45,909	184,176	5,642	12,023	4,738	8,330	30,734	214,910
General Rubber Co. of Brazil.	36,578	13,678	16,828	81,178	158,262	408	14,250	7,74	97,746	113,128	198,370
Arnaezs Andersen	7,043	6,757	71,700	18,100	93,600						93,600
Adelbert H. Alden, Ltd.	16,233	3,644	155	5,422	20,754						20,754
Gaspar Almeida & Co.	29,297	3,417	9,737	10,334	52,868						52,868
R. G. Armaez	19,270	6,476	424		26,170						26,170
Ohliver & Co.	51,874	13	20		51,907						51,907
H. Balding	35,649			14,077	39,726						39,726
Manoel F. Carioz	16,150	1,600	4,050		21,800						21,800
Ganzburger & Co.	1,246	92	2,913	12,356	16,607						16,607
Amarim Irmaos						3,582	1,380	4,756	2,176	11,844	11,844
Idao Martins d'Araujo.	8,143	1,518			10,629						10,629
Sumitres	2,143	394	9,182	10,878	22,599	532	950	5,438	200	7,120	29,719
Totals	420,113	69,135	138,304	209,326	836,878	21,600	29,243	16,977	193,577	261,457	1,098,335
In transit, July 1916.	10,431		4,419	71,467	86,317	6,975		562	4,736	12,273	98,590
Totals: May, 1916.	430,544	69,135	142,723	280,793	923,195	28,575	29,243	17,539	198,313	273,730	1,196,925
April, 1916.	334,337	48,556	168,393	277,014	928,300	212,682	50,555	35,419	252,036	350,692	1,478,992
March, 1916.	502,323	76,236	228,580	320,482	1,127,621	40,320	87,029	49,033	18,648	90,030	2,032,651
February, 1916.	546,003	82,739	191,537	205,419	1,025,698	164,400	27,819	56,344	119,229	367,792	1,393,490
January, 1916.	561,143	110,411	176,779	148,142	996,475	543,822	58,574	75,105	123,703	801,204	1,797,679

(Compiled by Suter & Co., Manaoas.)

IMPORTS AND EXPORTS OF CRUDE AND MANUFACTURED RUBBER AT THE PORT OF NEW YORK.

IMPORTS.

Week Ending—	India Rubber.		Scrap for Re-manufacture.		Balata.		Gutta Jelutong.		Gutta Percha.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
June 23, 1916.....	7,989,347	\$3,404	208,098	\$207.30	16,630	\$7,605	1,023,891	\$42,717	101,058	\$11,036
June 30, 1916.....	4,042,771	167	108,070	13,335	23,499	2,482	41,822	1,659	2,238	3,407
July 7, 1916.....	4,295,232	2,474,843	163,214	12,448	23,499	9,477			72,408	10,168
July 14, 1916.....	2,067,290	1,222,236								

*Pounds not specified.

EXPORTS.

FIGURES ISSUED FROM JUNE 26, 1916, TO JULY 24, 1916.

EXPORTED TO	Belting, Hose and Packing.	Footwear.		Tires.		Insulated Wire and Cables.	Other kind of India Rubber.	Four tan Pens.	Chewing Gum.	Reclaimed Rubber.	Scrap Rubber.
		Boots.	Shoes.	Auto.	Other.						
NORTH AMERICA:											
Bermuda.....	\$63		\$100			\$14	\$207	\$18			
British Honduras.....							37				
Canada.....							\$ 64	0			
Central American States—											
Costa Rica.....	40			\$105		204	455		\$133		
Guatemala.....	450			1,099			681		588		
Honduras.....	686			896	281		357				
Nicaragua.....	24						370				
Panama.....	3,123	\$96	1,886	5,920	160	6,693	5,556		683		
Salvador.....	813						2,698				
Mexico.....	2,812		296	5,071	569	5,088	2,459		131		
Newfoundland.....	276	12,109	3,995	33	477	970	2,440	47	274		
West Indies—											
British—											
Barbados.....	227			917	310	38	98		1		
Jamaica.....	1,141		39	2,935			478		59		
Trinidad and Tobago.....	786			1,433	239	136	1,084				
Other British.....	24,657		488	46,799	17,821	29,405	28,347	1,198	608		\$372
Other.....	344			221			18	7			
Dutch.....	105	5		666		8	85	148	2		
French.....	51			51			733				
Haiti.....	312	7	1	13	74	169	446	9			
Santo Domingo.....	2,444	3	42	2,834	385	251	783		73		
Totals, North America.....	\$39,195	\$12,220	\$6,847	\$69,324	\$20,543	\$43,231	\$46,999	\$1,418	\$2,573	\$172	
EUROPE:											
Denmark.....	\$50					\$535	\$935				
France.....	2,931		\$4,055	\$33,038	43,197	\$12,747	81,031		\$3,826		\$2,206
Greece.....						100			922		
Italy.....	59			51,987	58,577	6,990	15,699	\$1,801			
Netherlands.....	2,519			6,094		22,894	5,485				
Norway.....	130			960		14,655	1,579				
Portugal.....	112						359	439			
Russia in Europe.....	14					944	125				
Spain.....						2,830	215	929			
Sweden.....	3,914										
Switzerland.....			1,243			280	14				
United Kingdom—											
England.....	27,731		24,008	229,261	40,250	17,616	230,628	1,930	7,302	\$7,450	13,594
Scotland.....	14,697						2,383	305			16,484
Totals, Europe.....	\$54,157		\$29,306	\$320,740	\$142,559	\$78,956	\$338,513	\$6,249	\$11,950	\$7,450	\$32,284
SOUTH AMERICA:											
Argentina.....	\$19,265			\$73,655	\$8,911	\$12,669	\$40,579	\$658	\$1,284		
Bolivia.....							333				
Brazil.....	13,428	\$69	\$854	54,781	92	93,669	30,691	435			
Chile.....	40,720		\$34	1,727	3,697	4,403	3,113	39			
Colombia.....	1,479		70	810	453	770	5,431	70	20		
Ecuador.....	625			1,728		120	737	4			
Guiana—British.....	48			496		12	42		52		
Dutch.....	124		84	130	285		216				
Peru.....	1,483	1,050		400		1,216	786				
Uruguay.....	4,417		60	7,362	3,031	1,698	4,655		455		
Venezuela.....	441		76	2,857		3,403	4,313				
Totals, South America.....	\$82,030	\$1,119	\$1,668	\$143,996	\$18,676	\$120,962	\$90,896	\$1,206	\$1,811		
ASIA:											
China.....	\$381		\$10			\$143	\$3,056	\$26			
British East Indies—											
British India.....	897			\$935			364	362			
Straits Settlements.....	66		363	7,035	\$1,446						
Dutch East Indies.....	46			322			261				
Hongkong.....	200			129			64				
Japan.....	1,621		704			365					
Totals, Asia.....	\$3,160		\$1,077	\$8,485	\$1,646	\$448	\$3,814	\$398			
OCEANIA:											
British—											
Australia and Tasmania.....	\$22,909		\$2,218	\$5,169	\$8,937	\$14,537	\$21,161	\$390	\$1,373		
New Zealand.....	276		73	20,300	354	1,591	5,616	177	7,761		
Philippine Islands.....	\$580	\$61	756	1,401	2,169	7,006	4,333	384	588		
Totals, Oceania.....	\$24,965	\$61	\$3,047	\$26,870	\$5,560	\$23,124	\$31,110	\$951	\$9,722		
AFRICA:											
British Africa—											
West.....	\$1,112			\$183			\$365				
South.....	37,305	\$616	\$171	2,109	\$5,533	\$1,684	2,848		\$387		
East.....	1,143			696					26		
Egypt.....				164			2,610		120		
Portuguese Africa.....	1,313						119				
Totals, Africa.....	\$40,883	\$616	\$171	\$3,142	\$58,325	\$1,684	\$6,127		\$533		

In addition to the above Balata was exported to England valued at \$22,208, and Gutta Percha valued at \$2,520.

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—free.	April, 1916.		Ten Months Ending April, 1916.	
	Pounds.	Value.	Pounds.	Value.
India rubber:				
From France	44,807	\$34,297	424,394	\$248,349
Portugal	304,118	130,244	2,744,446	1,083,298
United Kingdom	3,808,921	3,371,403	57,518,634	37,451,106
Central and British Honduras	173,169	77,669	1,043,266	466,298
Mexico	75,602	35,724	3,952,606	1,124,767
Brazil	7,351,135	3,648,198	45,568,806	20,594,937
Other South America	277,932	127,039	4,976,238	2,246,781
East Indies	11,862,629	8,311,833	95,061,995	54,386,384
Other countries	15,354	11,284	632,810	440,514
Totals	23,912,732	\$15,731,366	210,886,288	\$118,495,434
Balata	108,130	2,800,835	867,217	21,476,000
Guayule gum	157,662	45,525	2,159,370	694,160
Gutta Jelutong	4,020,700	205,803	21,721,261	1,003,822
Gutta percha	226,965	26,669	2,066,604	229,398
Totals	28,524,883	\$16,117,502	240,347,868	\$131,434,024
Rubber scrap	1,317,604	112,019	13,957,807	1,667,569
Totals, unmanufactured	29,792,437	\$16,230,421	254,095,235	\$132,417,899
Chicle	700,640	\$285,728	6,142,314	\$2,311,984
MANUFACTURED—dutiable:				
Gutta percha		\$6,051		\$13,201
India rubber		37,850		304,267
Totals, manufactured		\$43,901		\$317,468
Substitutes—elasticon, etc.		759		\$15,168

EXPORTS OF DOMESTIC MERCHANDISE.

MANUFACTURED—	April, 1916.		Ten Months Ending April, 1916.	
	Pounds.	Value.	Pounds.	Value.
Automobile tires:				
To Russia in Europe*				\$1,116,270
England		\$91,483		7,405,965
Canada		18,877		909,278
Mexico		13,712		207,674
Cuba		53,533		405,132
Australia		157,076		1,011,928
New Zealand*		15,935		741,617
Philippine Islands		50,089		291,144
Other countries		183,581		2,199,054
Totals		\$1,447,184		\$14,618,062
All other tires		185,023		2,353,665
Belting, hose and packing		254,083		2,321,405
Rubber boots		36,761		1,485,737
Rubber shoes		37,509		867,270
Scrap and old rubber		152,224		340,781
Reclaimed rubber		581,657		5,568,931
Other rubber manufactures		778,376		5,576,883
Totals, manufactured		\$2,960,937		\$28,319,763
Fountain pens		45,127		\$14,200
Totals		\$14,200		\$123,823

EXPORTS OF FOREIGN MERCHANDISE.

UNMANUFACTURED—	April, 1916.		Ten Months Ending April, 1916.	
	Pounds.	Value.	Pounds.	Value.
Balata	26,790	\$13,089	426,561	\$169,760
Guayule gum			18,500	770
Gutta Jelutong			2,773	305
Gutta percha			60,013	11,446
India rubber	393,085	268,748	4,011,942	2,312,311
Rubber scrap and refuse			9,204	734
Totals, unmanufactured	419,875	\$281,837	4,529,003	\$2,502,326
Chicle	405	\$50	111,638	\$32,801
MANUFACTURED				
Gutta percha		\$9		\$537
India rubber		\$1		37,122
Totals, manufactured				\$37,659
EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.				
	April, 1916.		Ten Months Ending April, 1916.	
	Pounds.	Value.	Pounds.	Value.
To Alaska:				
Belting, hose and packing		\$11,279		\$107,402
Boots and shoes, etc.	10,649	27,702		146,430
Other rubber goods		6,168		29,627
Totals		\$55,149		\$283,459
To Hawaii:				
Belting, hose and packing		\$14,274		\$77,813
Automobile tires		37,497		441,276
Other tires		8,224		63,391
Other rubber goods		6,757		\$72,589
Totals		\$66,752		\$655,069

To Philippine Islands:

Belting, hose and packing	\$6,182	\$51,167
Boots and shoes, etc.	16,717	14,696
Tires	70,911	360,435
Other rubber goods	15,293	144,818
Totals	\$92,896	\$572,656

To Porto Rico:

Belting, hose and packing	\$4,009	\$34,374
Automobile tires	38,126	312,404
Other tires	1,080	29,440
Other rubber goods		\$2,465
Totals	\$49,773	\$432,743

*Not separately stated prior to January 1, 1916.

RUBBER STATISTICS FOR CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—free.	April, 1915.		April, 1916.	
	Pounds.	Value.	Pounds.	Value.
Rubber and gutta percha, crude				
catechu or india rubber				
From Great Britain	213,027	\$116,267	641,762	\$486,987
United States	217,063	110,882	448,706	281,357
Straits Settlements			33,849	21,607
Other countries	2,240	1,333		
Totals	432,870	\$219,482	1,101,287	\$788,911
Rubber, re-covered:				
From United States	360,982	\$43,011	333,956	\$53,860
Hard rubber, in sheets and rods:				
From United States	1,262	\$162	411	\$323
Rubber substitute:				
From Great Britain	4,938	\$501		
United States	30,126	2,260	70,847	\$6,054
Totals	35,074	\$2,761	70,847	\$6,054
Rubber, powdered, and rubber				
gutta percha waste:				
From United States	18,119	\$2,647	203,353	\$8,603
Other countries			2,853	114
Totals	18,119	\$2,647	206,205	\$8,807
Rubber thread, not covered:				
From United States	1,803	\$2,499	4,318	\$6,544
Balata, crude:				
From United States	230	\$131		
Chicle, crude:				
From United States	54,531	\$21,998	18,056	\$7,403
British Honduras	46,283	17,401	217,120	80,506
Mexico	79,387	27,953		
Totals	180,201	\$68,352	235,176	\$87,909

MANUFACTURED—dutiable.	April, 1915.		April, 1916.	
	General Tariff. Value.	Preferential Tariff. Value.	General Tariff. Value.	Preferential Tariff. Value.
Waterproof clothing:				
From Great Britain	\$146	\$47,492		\$22,904
United States	7,200			\$20,524
Totals	\$7,355	\$47,492		\$20,524
Hose, lined with rubber:				
From Great Britain		\$43		
United States	\$5,735			\$6,872
Totals	\$5,735	\$43		\$6,872
Mats and matting:				
From United States	\$298			\$753
Packing:				
From Great Britain		\$321		
United States	\$4,930			\$5,464
Totals	\$4,930	\$321		\$5,464
Tires of rubber for all vehicles:				
From Great Britain	\$97	\$3,726	\$1,831	\$1,437
United States	\$17,757		\$20,232	
France	2,863			
Other countries	246			
Totals	\$18,963	\$3,726	\$52,063	\$1,437

*Rubber cement, and all other manufactures of india rubber and gutta percha, N. O. P.:				
From Great Britain	\$275	\$22,286	\$319	\$22,704
United States	62,921		65,377	
Other countries	39		102	
Totals	\$63,235	\$22,286	\$65,798	\$22,704

Hard rubber, in tubes:				
From United States	\$1,038		\$75	
Boots and shoes:				
From Great Britain		\$169		\$420
United States	\$4,792		\$5,011	
Totals	\$4,792	\$169	\$5,011	\$420
Belting:				
From Great Britain		\$968		\$202
United States	\$2,120		\$855	
Totals	\$2,120	\$968	\$855	\$202
Webbing over one inch wide:				
From Great Britain		\$574		\$121
United States	\$8,522		\$13,161	
Other countries	2			
Totals	\$8,522	\$574	\$13,161	\$121

*In addition the imports of rubber cement and all manufactures of india rubber and gutta percha not otherwise provided for amounted to \$534 from various countries for April, 1916, and \$78 for April, 1915.

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	April, 1915.	April, 1916.		April, 1915.	April, 1916.
	Prod- uce of Canada. Value.	Re-exports of foreign goods. Value.		Prod- uce of Canada. Value.	Re-exports of foreign goods. Value.
MANUFACTURED— <i>Intiable</i> :					
Belting:					
To United States		\$35			
Newfoundland				\$439	
Totals		\$35		\$439	
Hose:					
To Great Britain				\$18,059	
United States	\$3,004				
Newfoundland				188	
Other countries				101	
Totals	\$3,004			\$18,348	
Boots and shoes:					
To Great Britain	\$238			\$13,523	
United States	15	\$28		0	
Newfoundland				279	
Australia	15				
Other countries	1,332			1,332	
Totals	\$1,597	\$28		\$15,145	
Tires:					
To Great Britain				\$77,759	
United States				21,876	
Newfoundland				1,200	
Other countries				1,739	
Totals				\$102,574	
*Rubber waste:					
To Great Britain				\$7,313	
United States				\$1,347	
Totals				\$1,347	\$22,744
All other mfrs., N. O. P.:					
To Great Britain	\$30,391			\$2,023	
United States	3,033	\$94,961		198	
Newfoundland	247			354	
Australia	1,952				
Other countries	697			276	
Totals	\$36,310	\$94,961		\$2,851	
†Gum chicle:					
To United States	\$13,373	\$15,000		\$114,860	
Other countries	2,078				
Totals	\$15,451	\$15,000		\$114,860	

*During April, 1916, 194,100 pounds of rubber waste were exported to the United States and 60,900 pounds to Great Britain. During April, 1915, 23,500 pounds were exported to the United States.

†During April, 1916, 114,860 pounds of gum chicle were exported to the United States. During April, 1915, 23,066 pounds were exported to the United States and 3,151 pounds to various countries.

	May, 1916.		Five Months Ending May, 1916.	
UNMANUFACTURED	Pounds.	Value.	Pounds.	Value.
Italy	7,500	\$4,468		
Liberia			3,660	2,061
United States			2,000	1,030
Mexico	9,000	6,072		
Colombia	9,100	4,423		
Peru			55,800	36,139
Brazil			1,449,500	879,222
Bolivia			4,800	2,683
Gambia			300	136
Ceylon			217,200	79,524
Nigeria			59,600	15,955
Cape of Good Hope	9,700	7,071		
Zanzibar and Pembar	9,800	4,515		
E. Africa Protectorate	1,600	972	2,200	1,458
Anglo-Egyptian Sudan	9,600	7,727		
Aden & Dependencies			700	379
British India	192,800	127,662		
Straits Settlements	1,854,200	1,215,223	327,900	219,516
Fed. Malay States	3,436,500	2,354,762	6,700	4,024
Ceylon and Depend- encies	1,267,200	825,738	46,100	28,557
British North Borneo	157,500	107,328		
British West Indies	4,400	292		
British Honduras			1,500	826
British Guiana	500	243		
Totals	8,577,000	\$5,786,346	2,425,900	\$1,361,910
Waste and reclaimed rubber:				
UNMANUFACTURED:				
From Canary Island	2,700	\$136		
China	23,500	1,837		
United States	37,900	5,929	83,800	\$10,852
Chile			78	374
Malta	200	78		
Gold Coast			4,000	243
Egypt	4,700	573		
Cape of Good Hope	47,800	2,556		
Malat	3,700	705		
British India	15,700	1,458	10,000	1,152
Ceylon and Depend- encies	6,400	306		
British West Indies	300	48		
Totals	142,900	\$13,626	100,500	\$12,621

	RE-EXPORTS.			
	Pounds.	Value.	Pounds.	Value.
Crude rubber:				
To Russia	6,700	4,860	126,100	87,840
Sweden	164,000	79,733	4,500	2,430
Norway	15,700	12,315	51,500	37,923
Denmark	19,900	13,368		
France	1,033,600	751,259	894,300	628,339
Switzerland	11,300	6,804		
Spain	205,800	148,560	168,700	107,805
Japan				
Italy			51,100	41,694
Argentina	6,400	3,506	171,800	125,286
Canada	127,700	84,953	11,400	11,311
United States	6,525,200	4,619,275	333,100	118,365
Totals	8,140,300	\$5,742,143	1,832,700	\$1,171,693
Waste and reclaimed rubber:				
To France			24,900	4,262
Spain			2,200	243
Totals			27,100	4,505
EXPORTS.	Pounds.	Value.	Pounds.	Value.
Waste and reclaimed rubber:				
Mfrs. of the United King- dom:				
To Russia			6,900	666
France	23,000	4,802	76,800	14,429
Italy			7,800	1,604
Spain	35,700	3,786	13,900	1,628
Italy	38,500	21,559	6,600	646
United States	504,300	27,566	122,100	15,839
Straits Settlement	3,300	612		
Totals	974,800	\$58,325	234,100	\$34,812

LONDON AND LIVERPOOL RUBBER STATISTICS.

IMPORTS.

JUNE, 1916.

	London.		Liverpool.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED:				
Crude rubber:				
From German West Africa	\$51,400	\$596,750	3,500	\$1,283
Dutch Borneo	1,500	1,021		
Other Dutch Posses- sions in Indian Seas	703,700	494,315		
France			1,000	656
French West Africa			141,300	87,878
Portugal	54,000	26,730	2,200	583

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	Three Months Ending March, 1915.		Three Months Ending March, 1916.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED				
India rubber and gutta percha raw and reclaimed:				
From Straits Settlements	370,040		424,160	
African Fr. Colony			6,380	
Belgian Congo			20,780	
Brazil	735,020		2,114,420	
Other countries	61,600		456,940	
Totals	1,166,660	\$716,435	3,122,680	\$1,917,609
MANUFACTURED				
From Straits Settlements				
From Africa Fr. Colony				
From Belgium Congo				
From Brazil				
From other countries				
Totals				

MANUFACTURED	Three Months Ending March, 1915.		Three Months Ending March, 1916.		Elastic webbing				
	Pounds.	Value.	Pounds.	Value.					
India rubber and gutta percha threads					To France	440	1,540		
From United States	10,780	.....	9,960	.....	Germany	14,300	14,960		
Great Britain	9,680	.....	10,780	.....	France	220	3,890		
Other countries	.....	.....	440	.....	Argentina	9,460	25,740		
Totals	30,480	\$33,308	21,120	\$33,330	Italy	22,220	18,260		
India rubber and gutta percha sheets					Other countries	12,980	5,860		
Our sheets	1,190	\$1,437	440	\$533	Totals	71,720	\$100,669	96,580	\$135,563
Elastic fabric	1,340	473	220	57	Elastic fabric—not specified:				
Hard rubber	1,190	675	18,700	\$11,483	Isoprene	660	480		
India rubber and gutta percha tubes					Neoprene	1,340	5,940		
Our sheets	440	\$656	440	\$656	Other countries	1,760	4,400		
Elastic fabric:					Totals	5,060	\$7,990	11,000	\$17,370
From Austria-Hungary	200	.....	.....	.....	Tires:				
Germany	1,640	.....	.....	.....	To France	59,620	.....	.....	.....
Other countries	15,840	.....	1,840	.....	Great Britain	1,825,560	.....	.....	.....
Totals	18,760	\$8,038	1,540	\$662	Switzerland	17,200	66,000	.....	.....
Other forms	1,340	\$743	1,100	\$531	India and Ceylon	7,920	80,500	.....	.....
Belted	1,190	\$6,369	32,120	\$16,907	Australia	660	31,600	.....	.....
Rubber coated fabrics	14,840	\$15,826	34,760	\$46,593	Argentina	165,220	236,280	.....	.....
Other forms	3,740	.....	16,000	.....	Brazil	78,540	120,780	.....	.....
From Great Britain	200	.....	.....	.....	Other countries	1,262,140	80,080	.....	.....
Other countries	200	.....	.....	.....	Totals	1,692,680	\$2,064,069	2,500,530	\$3,049,157
Totals	3,940	\$2,005	19,120	\$6,658	Other rubber manufactures:				
Rubber boots and shoes, galas					To Great Britain	16,720	.....	.....	.....
From United States	6,572	.....	9,673	.....	Switzerland	44,660	4,180	.....	.....
Austria-Hungary	1,531	.....	10,023	.....	Argentina	20,460	20,460	.....	.....
Germany	40	.....	.....	.....	Other countries	17,140	58,740	.....	.....
Other countries	2,886	.....	45	.....	Totals	170,980	\$107,294	100,100	\$62,349
Totals	10,814	\$8,117	19,741	\$15,240	Total Exports	2,145,100	\$2,365,963	3,108,600	\$3,399,036
Elastic webbing:									
From Austria-Hungary	2,080	.....	.....	.....		
France	3,080	.....	.....	.....		
Germany	16,940	.....	880	.....				
Other countries	5,060	.....	4,180	.....				
Totals	28,160	\$39,526	8,580	\$12,043					
Elastic fabric—not specified:									
From Austria-Hungary	5,500	.....	.....	.....		
France	2,200	.....	134,200	.....				
Germany	12,540	.....	.....	.....		
Great Britain	21,780	.....	31,020	.....				
Other countries	1,320	.....	1,320	.....				
Totals	43,340	\$26,441	166,540	\$102,136					
Tires:									
From France	20,240	.....	157,740	.....				
Germany	1,980	.....	73,480	.....				
Great Britain	33,000	.....	18,480	.....				
Other countries	600	.....	.....	.....		
Totals	55,820	\$68,140	249,700	\$304,486					
Other rubber manufactures:									
From Austria-Hungary	5,720	.....	.....	.....		
France	2,640	.....	489,720	.....				
Germany	35,860	.....	.....	.....		
Great Britain	14,580	.....	183,700	.....				
Other countries	16,440	.....	.....	.....		
Totals	103,840	\$45,548	862,400	\$378,280					
Total Imports	.....	\$973,435	.....	\$2,913,494					

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED	Three Months Ending March, 1915.		Three Months Ending March, 1916.	
	Pounds.	Value.	Pounds.	Value.
India rubber and gutta percha—raw and reclaimed	1,203,440	\$2,7167	308,880	\$69,093
MANUFACTURED				
India rubber and gutta percha threads				
To France	.....	.....	2,420	.....
Germany	5,720	.....	.....	.....
Great Britain	.....	.....	1,760	.....
Argentina	660	.....	.....	.....
Other countries	8,580	.....	2,640	.....
Totals	14,960	\$23,623	9,020	\$14,343
India rubber and gutta percha sheets				
Our sheets	3,080	\$4,080	2,200	\$2,914
Thrust-in-holes	880	270	.....	.....
Insulated wires	1,100	.....	.....	.....
Hard rubber	15,620	5,992	25,300	15,536
India rubber and gutta percha tubes				
Our sheets	.....	.....	7,040	\$10,499
Elastic fabric	31,020	\$13,334	18,480	7,944
Other forms	15,840	7,641	28,600	13,799
Totals	440	332	800	464

THE RUBBER SCRAP MARKET.

Copyright, 1916.

NEW YORK.

THERE was very little prospect early in July of much activity in the rubber scrap market during the month. And so it was proven, as week after week passed without important changes in market conditions or price levels. It is true that values were slightly lower at the close of the month, which is only a natural result of weakness, due to a dull market.

The mills are undoubtedly well supplied with stocks that will carry them over the quiet period between now and the time for speeding up for fall business. As crude rubber responds to the dictation of London, in a similar way rubber scrap is influenced by the conditions controlling the crude rubber market, which has been quiet.

Boots and shoes, early in the month, developed an easier tendency and some dealers were making offers of 8½ cents delivered. It was reported that buyers were secured at these figures. Tires were quiet, with the exception of a little movement in mixed auto tires at 6½ cents. White goods were nominally quoted to mills at 8½ to 8¾ cents, and bicycle tires were steady at 4½ to 4¾ cents. There was no change in No. 1, inner tubes, being nominally held at 26 to 27 cents delivered. The balance of the list was devoid of new features and prices were nominally unchanged.

The month closed without improvement in the generally dull condition that has characterized the rubber scrap market for the past month. There is belief in some quarters that a general buying movement is due early in August. By referring to the following market quotations of July 28, it will be seen that there has been a slight downward revision of prices since a month ago, and practically no change during the last three weeks of July.

NEW YORK QUOTATIONS FOR CARLOAD LOT DELIVERED.

JULY 28, 1916.

Prices subject to change without notice.		Per Pound.	
Boots and shoes	.....	\$0.08 1/2	.....
Trammel acetates	.....	06 1/2	06 7/8
White tires, Goodrich and Goodyear	.....	06 1/2	06 1/2
Auto tires, standard white	.....	06 1/2	06 1/2
standard mixed	.....	06 1/2	06 1/2
stamped, unmanufactured	.....	04 1/2	04 1/2
Auto peelings, No. 1	.....	06 1/2	06 1/2
No. 2	.....	08	08 1/2

Inner tubes, No. 1	25 00	25 1/2
Inner tubes, No. 2	11 00	11 1/2
Inner tubes, No. 3	10 00	10 1/2
Inner tubes, No. 4	04 00	04 1/2
Inner tubes, No. 5	05 80	05 1/2
Inner tubes, No. 6	10 00	10 1/2
Inner tubes, No. 7	10 00	10 1/2
Inner tubes, No. 8	08 00	08 1/2
Inner tubes, No. 9	03 14	03 1/2
Inner tubes, No. 10	02 00	02 1/2
Inner tubes, No. 11	01 80	01 1/2
Inner tubes, No. 12	01 00	01 1/2
Inner tubes, No. 13	01 00	01 1/2
Inner tubes, No. 14	01 00	01 1/2
Inner tubes, No. 15	01 00	01 1/2
Inner tubes, No. 16	01 00	01 1/2
Inner tubes, No. 17	01 00	01 1/2
Inner tubes, No. 18	01 00	01 1/2
Inner tubes, No. 19	01 00	01 1/2
Inner tubes, No. 20	01 00	01 1/2
Inner tubes, No. 21	01 00	01 1/2
Inner tubes, No. 22	01 00	01 1/2
Inner tubes, No. 23	01 00	01 1/2
Inner tubes, No. 24	01 00	01 1/2
Inner tubes, No. 25	01 00	01 1/2
Inner tubes, No. 26	01 00	01 1/2
Inner tubes, No. 27	01 00	01 1/2
Inner tubes, No. 28	01 00	01 1/2
Inner tubes, No. 29	01 00	01 1/2
Inner tubes, No. 30	01 00	01 1/2
Inner tubes, No. 31	01 00	01 1/2
Inner tubes, No. 32	01 00	01 1/2
Inner tubes, No. 33	01 00	01 1/2
Inner tubes, No. 34	01 00	01 1/2
Inner tubes, No. 35	01 00	01 1/2
Inner tubes, No. 36	01 00	01 1/2
Inner tubes, No. 37	01 00	01 1/2
Inner tubes, No. 38	01 00	01 1/2
Inner tubes, No. 39	01 00	01 1/2
Inner tubes, No. 40	01 00	01 1/2
Inner tubes, No. 41	01 00	01 1/2
Inner tubes, No. 42	01 00	01 1/2
Inner tubes, No. 43	01 00	01 1/2
Inner tubes, No. 44	01 00	01 1/2
Inner tubes, No. 45	01 00	01 1/2
Inner tubes, No. 46	01 00	01 1/2
Inner tubes, No. 47	01 00	01 1/2
Inner tubes, No. 48	01 00	01 1/2
Inner tubes, No. 49	01 00	01 1/2
Inner tubes, No. 50	01 00	01 1/2

Exports of waste and reclaimed rubber from London and Liverpool for June, 1916, were 600 tons, divided as follows: United States, 313 tons; Italy, 197 tons; France, 49 tons; Spain, 35 tons; Java and Straits Settlements, 6 tons.

MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

It was generally expected that the official figures for June would indicate a falling off in the condition of the present cotton crop. The actual report, however, revealed a condition of 81.1 compared with 80.2, the ten-year average. Favorable crop progress during June is not, as a rule, accepted as conclusive evidence of future yield. More apprehension is felt of the uncertainty between now and the maturing period, particularly on account of the restriction in the use of fertilizer and the evidence that boll weevil are more numerous than ever before within a restricted area.

EGYPTIAN COTTON.

Cabled reports from Alexandria indicate a rather sensitive market, due, no doubt, to the approaching finish of the old crop stock. There is apparently a good demand from abroad, which is rapidly exhausting present stocks, resulting in a very narrow market that is extremely liable to fluctuate. Sakelaries qualities are practically exhausted. Crop growth is reported to be very satisfactory.

SEA ISLAND COTTON.

The weather during the month of June has been generally favorable, and the crop has made satisfactory progress. The entire section has had beneficial rains, which have improved the outlook very much. Although in some instances the young plant is reported small and backward, the general condition is quite up to a good average, and with continuance of favorable weather the new crop may begin to come to market the latter part of August and early September. Estimates still are about 100,000 bales and upwards.

TIRE FABRICS.

The July market for tire fabrics has generally maintained a strong position, although the situation during the last week of the month appeared to be somewhat easier. This was due to the usual quiet that prevails at this time of the year, when full deliveries are not strictly held to contract.

Producers have therefore been able to meet their obligations that would have been otherwise burdensome. Deliveries of new loom equipment are slow and overtime and double shift operations are seriously interfered with through a scarcity of textile workers.

Sea Island building fabric has advanced, but Egyptian and Peellers have recorded no change during the month.

COTTON DUCK.

The demand for duck has been accelerated by orders for

government requirements and the market is firm with prices of hose and belting duck at the same levels as a month ago.

NEW YORK QUOTATIONS.

JULY 27, 1916.

Prices subject to change without notice.

Aeroplane and Balloon Fabrics:	
Wamsutter, S. A. I. L. No. 1, 40-inch.....	yard \$0.26 @
Do, No. 4, 36-inch.....	36 @
Do, No. 4, 36-inch.....	12 1/2 @
O/X B.	
Wool Stockinettes—52-inch:	
A—14-ounce.....	yard 1.12 1/2 @
B—14-ounce.....	1.25 @
C—14-ounce.....	1.50 @
Cotton Stockinettes—52-inch:	
D—14-ounce.....	yard .49 @ .50
E—14-ounce.....	.39 @ .40
F—14-ounce.....	.53 @ .54
G—8-ounce.....	.43 @ .44
H—14-ounce.....	.48 @ .49
I—9-ounce.....	.40 1/2 @ .41 1/2
Colors—white, black, blue, brown.	
Tire Fabrics:	
17 1/2-ounce Sea Island, combed.....	square yard .83 @
17 1/2-ounce Egyptian, combed.....	.70 @
17 1/2-ounce Egyptian, carded.....	.63 @ .67
17 1/2-ounce Peellers, carded.....	.45 @ .50
Sheeting:	
40-inch 2.25-yard.....	yard .10 1/2 @
40-inch 2.50-yard.....	.10 @
40-inch 2.70-yard.....	.09 1/2 @
40-inch 2.85-yard.....	.08 1/2 @
40-inch 3.15-yard.....	.08 1/2 @
Osnaburgs:	
40-inch 2.25-yard.....	yard .12 @
40-inch 2.48-yard.....	.11 @
37 1/2-inch 2.48-yard.....	.11 1/2 @
Mechanical Ducks:	
Hose.....	found .28 @ .29
Belting.....	.28 @ .29
Carriage Cloth Duck:	
38-inch 2.00-yard enameling duck.....	yard .14 @
38-inch 1.74-yard.....	.16 @
72-inch 16.66-ounce.....	.33 @
72-inch 17.21-ounce.....	.34 @
Drills:	
38-inch 2.00-yard.....	yard .14 @
40-inch 2.47-yard.....	.11 @
52-inch 1.90-yard.....	.15 @
52-inch 1.95-yard.....	.14 1/2 @
60-inch 1.52-yard.....	.20 @
Yarns:	
Garden Hose, 12/2 cabled.....	pound \$0.28 @ .30
Fire Hose 12/1.....	.27 @ .29
Imported Woolen Fabrics Specially Prepared for Rubberizing—Plain and Fancies:	
63-inch, 3 1/2 to 5 ounces.....	square yard .38 @ 1.55
36-inch, 2 1/2 to 5 ounces.....	.35 @ .85
Imported Plaid Lining (Union and Cotton):	
63-inch, 2 to 4 ounces.....	square yard .35 @ .75
36-inch, 2 to 4 ounces.....	.20 @ .45
Domestic Worsted Fabrics:	
36-inch, 4 1/2 to 8 ounces.....	square yard .25 @ .45
36-inch, 3 1/2 to 5 ounces.....	square yard 1 1/2 @ .20
Raincoat Cloth (Cotton):	
Bombazine.....	yard .06 @ .08
Twills.....	.10 @ .15
Tweeds.....	.20 @ .35
Tweed, printed.....	.06 @ .15
Plaid.....	.08 @ .10
Rep.....	.18 1/2 @ .25
Burlaps:	
32—7 1/2-ounce.....	100 yards 6 1/2 @
40—7 1/2-ounce.....	6 5/8 @
40—8-ounce.....	6 5/8 @
40—10-ounce.....	7 5/8 @
40—10 1/2-ounce.....	7 7/8 @
45—7 1/2-ounce.....	7 80 @
45—8-ounce.....	7 90 @
48—10-ounce.....	12 1/2 @

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

Copyright, 1916.

NEW YORK.

THE summer dullness usually experienced at this time of the year has had a depressing effect on the market for the past month. The mills are busy with stock taking, making repairs and additions to plant equipment in anticipation of a record fall business, and are paying little attention to present market con-

ditions. They are well supplied with materials bought at the high figures ruling early in the summer, and the indications are that lower prices now ruling will not prove attractive until buyers are forced to come into the market for fall requirements. This situation makes the market easy, with a tendency to further lower values of certain materials that have already declined during the month.

The decline in values of the basic metals during the month is the fundamental cause of lower prices in the chemical market. Colors of domestic source are firm, though some recessions in price are noted. Imported grades are still high and scarce, with no prospect of a change for the better.

ANTIMONY SULPHURETS. The domestic production of both crimson and golden antimony of the best grades is meeting with a good demand; however, prices have declined about 5 cents a pound and are now almost normal.

BENZOL. The recent increase in output has resulted in a decline of 5 cents a gallon from prices ruling a month ago.

BARYTES. Consumption is about normal on both grades, and stocks in first hands are moderate, which accounts for the firm prices quoted.

LITHARGE. There has been a steady undertone to the market during this month, due to a good demand with only moderate stocks in sight.

LITHOPONE. Producers have been well sold ahead and consumers appear to be well covered. Liberal offers in second hands evidently have weakened the market, which has declined.

WHITING. The unchanged chalk situation and high freights with no immediate relief in sight have strengthened the position of whitening. Prices are firm and spot stocks are scarce.

ZINC OXIDE. With prices fixed on both American and French process zinc oxide for the next six and three months, respectively, there is nothing new to record.

NEW YORK QUOTATIONS.

JUNE 29, 1916.

Subject to change without notice.

Acetone (drums).....	lb.	\$0.40 @	
Acid, acetic, 28 per cent. (bbls.).....	lb.	.06 @	.06 1/2
creylic (crude).....	gal.	.75 @	.80
glacial, 99 per cent. (carboys).....	lb.	.45 @	.50
muratic, 20 degrees.....	lb.	.02 1/2 @	
nitric, 36 degrees.....	lb.	.06 1/2 @	
sulphuric, 60 degrees.....	lb.	.01 @	
Alumina Pigment, No. 1 (casks).....	ton	26.00 @	
Aluminum Flake (carloads).....	ton	2.50 @	
Ammonium carbonate.....	ton	.09 1/2 @	.10
Antimony, crimson, sulphuret of (casks).....	lb.	.70 @	.80
crimson, "Mephisto" (casks).....	lb.	.75 @	
golden, sulphuret of (casks).....	lb.	.40 @	
golden, "Mephisto" (casks).....	lb.	.45 @	
golden, sulphur, States brand, 16-17 per cent. lb.	lb.	.45 @	
Asbestine.....	ton		
Asphaltum "G.P. Brilliant".....	lb.		.40
Barium sulphate, precipitated.....	ton	30.00 @	35.00
Barytes, pure white.....	ton		
off color.....	ton		
Basoform.....	ton	160.00 @	
Benzol, pure.....	gal.	.70 @	.75
Beta-Naphthol.....	lb.	1.35 @	1.50
Black Hypo.....	lb.		
Bone ash.....	lb.		
black.....	lb.		
Cadmium sulphate (1 lb. in 1 lb. of lead).....	lb.	.04 @	.08
yellow.....	lb.		
Castella gum.....	lb.		.35
Carbons, bisulphide (drums).....	lb.		
black (cases).....	lb.		
tetrachloride (drums).....	lb.		
Caustic soda, 76 per cent.....	lb.	.04 @	.04 1/2
Chalk, precipitated, extra light.....	lb.	.04 1/2 @	.05 1/2
precipitated, heavy.....	lb.		
China clay, domestic.....	ton		
imported.....	ton		
Chromic, green.....	lb.	.50 @	
yellow.....	lb.		
Coal tar.....	bbbl.		
Corn oil, refined.....	ton		
Cotton linters.....	lb.		
Gas black.....	lb.		
Glycerine.....	ton		
Glycyne, C. P. (drums).....	ton		
Graphite, 48 (400 pound bbl.).....	lb.	.12 @	

powdered (400 pound bbl.).....	lb.	.06 @	
Green oxide of chromium (casks).....	lb.	.75 @	
original glass thin.....	bbbl.	.03 1/2 @	
Indian red, refined grades.....	lb.	.45 @	.05 1/2
put.....	lb.	.05 1/2 @	.07 1/2
Infusorial earth, powdered.....	ton	60.00 @	
bolated.....	ton	65.00 @	
Iron oxide, red, reduced grades.....	lb.	.02 1/2 @	.03 1/2
red, pure, bright.....	lb.	.08 @	.08 1/2
Ivory, black.....	lb.	.10 @	.30
Lampblack.....	lb.	.12 @	.18
Lead, red oxide of.....	lb.	.09 1/2 @	.10
sublimed.....	lb.	.08 1/2 @	.09
sublimed white.....	lb.	.08 1/2 @	.09
white, basic carbonate.....	lb.	.08 1/2 @	.09
white, basic sulphate.....	lb.	.08 1/2 @	.09
Lime, flour.....	ton		.01 1/2
Litharge.....	lb.	.09 @	.10
English.....	lb.	.10 @	.11
Lithopone, domestic.....	lb.	.10 @	.11
imported.....	lb.	.12 @	.14
Magnesia, carbonate.....	lb.	.12 @	.15
calcined.....	lb.	.60 @	.70
heavy, Thistle Brand.....	lb.	.14 @	
light.....	lb.	.60 @	.70
Magnesian, calcined, powdered.....	ton	35.00 @	40.00
Mica, powdered.....	lb.	.03 1/2 @	.05
Mineral rubber.....	lb.	.01 1/2 @	.03 1/2
linseed (bbls.).....	ton	100.00 @	
"Cienasco".....	ton	16.50 @	
"M. R.".....	ton	50.00 @	
"Richmond Brand".....	ton	.03 @	
"No. 64 Brand".....	ton	35.00 @	
Naphtha, stove gasoline (steel bbls.).....	gal.	.24 @	
66 @ 68 degrees.....	gal.	.28 @	
68 @ 70 degrees.....	gal.	.29 @	
V. M. & P.....	gal.	.23 @	
Oil, aniline.....	lb.	.45 @	.55
linseed (bbls.).....	gal.	.70 @	
palm.....	gal.	.13 1/2 @	.14
paraffin.....	gal.	.17 @	
pine (cases).....	gal.	.70 @	
rapeseed.....	gal.	1.00 @	1.05
rosin, heavy body.....	gal.	.38 @	
tar (cases).....	gal.	.21 @	
soluble aniline colors, yellow.....	lb.	.10 @	.75
blue, green.....	lb.	.12 @	.12 1/2
Orange mineral, domestic.....	lb.	.12 @	
Paragol (casks).....	lb.	8.50 @	
Petrolatum.....	lb.	.05 1/2 @	
Petroleum grease.....	lb.	.04 1/2 @	
Pine tar.....	bbbl.	7.50 @	
Pitch, burgundy.....	lb.	.03 1/2 @	.04
pine.....	lb.	3.50 @	4.00
Plaster of paris.....	lb.	1.50 @	1.70
Prussian blue.....	lb.	1.50 @	
Pumice stone, powdered (bbls.).....	lb.	.03 @	.04
Resin, Pontianak, refined.....	lb.	.15 @	
granulated.....	lb.	.15 @	
tused.....	lb.	.14 @	
Rosin (280 pound bbls.).....	ton	8.00 @	
Rotten stone, powdered.....	lb.	.02 1/2 @	.04
Rubber black.....	lb.	.04 1/2 @	
Rubber substitute, white.....	lb.	.07 1/2 @	.09 1/2
brown.....	lb.	.13 @	.17 1/2
Rubslide.....	ton		Nominal
Shellac, fine orange.....	lb.	.30 @	.33
Saponstone, powdered.....	ton	7.50 @	20.00
Starch, corn, powdered.....	lb.	.02 1/2 @	.02 1/2
Sulphur chloride (drums).....	ton	.05 1/2 @	.09 1/2
Sulphur, floss, velvet, Brooklyn brand (carloads).....	ton	2.20 @	
Talc, American.....	ton	1.50 @	17.50
Toluol, pure.....	gal.	4.50 @	4.75
Tri-tilite earth, powdered.....	lb.	.03 @	.03 1/2
Turpentine, pure gum spirits.....	gal.	.48 1/2 @	
worm.....	gal.	.51 @	
Venice.....	gal.	.51 @	.12
Ultramarine blue.....	lb.	.10 @	.50
Vermilion, brilliant.....	lb.	1.00 @	1.25
yellow.....	lb.	.95 @	1.00
Wax, beeswax, white.....	lb.	.48 @	.60
carolin, white.....	lb.	.08 @	.20
carolin, yellow.....	lb.	.26 @	.42
zosterite, black.....	lb.	.30 @	.35
zosterite, white.....	lb.	.30 @	.35
montan.....	lb.	.20 @	.32
paraffin, refined, 118/120 m. p. (cases).....	lb.	.06 1/2 @	
123/125 m. p. (cases).....	lb.	.07 @	
128/130 m. p. (cases).....	lb.	.08 @	
133/136 m. p. (cases).....	lb.	.09 1/2 @	.12
crude, white, 117/119 m. p. (bbls.).....	lb.	.05 @	
yellow, 124/126 m. p. (bbls.).....	lb.	.05 1/2 @	
Whitene Mica.....	ton	.54 @	.65
commercial.....	ton	.54 @	1.00
Paris, white, American.....	ton	.90 @	1.00
English (drums).....	ton	1.50 @	
Wood pulp, XXX.....	ton	22.00 @	
Yellow ochre (Satin).....	lb.	.02 @	
Zinc oxide, American process, horsehead brand.....	lb.		
special.....	lb.	10 1/2 @	
French process, green seal, f. o. b. factory lb.	lb.	16 1/2 @	
red seal, f. o. b. factory lb.	lb.	16 1/2 @	
white seal, f. o. b. factory lb.	lb.	17 1/2 @	.24
Zinc sulphide, pure.....	lb.		None



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THE SLIPKNOT RUBBER HEEL.

A new rubber heel has recently come on the market. This is the "Slipknot," and the appropriateness of the name will be seen from the accompanying illustration in which it will be noticed that a slipknot forms a part of the design. Not all commodity names involving a pun are to be commended, but this one is a happy selection, as it describes the character of the heel and enables the name to be easily remembered. Another point brought out by the accompanying cut is the raised crescent-shaped section around the back of the heel, which adds to its durability and its non-slipping qualities. [Plymouth Rubber Co., Canton, Massachusetts.]



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TABLE OF CONTENTS ON LAST PAGE OF READING.**PURE RUBBER AND THE BARKLEY BILL.**

A BILL introduced by Congressman Barkley "to prohibit the manufacture, sale or transportation in interstate commerce of misbranded articles; to regulate the traffic therein, and for other purposes," has passed the House of Representatives recently and now awaits action by the United States Senate. It differs from previous pure goods acts in that it seeks, not to compel manufacturers to list the ingredients upon their products or packages containing them, but to impose penalties upon those who misbrand their goods. By this is meant placing upon a product "any word, statement, symbol, design, device or indication which is false, fraudulent, deceptive or misleading . . . as to the materials or substances of which it is composed." A further provision makes it unlawful to publish, issue or circulate "in any newspaper, magazine, book, pamphlet, circular or other publication or advertisement any false, fraudulent, misleading or deceptive word, statement, representation, symbol or device as to the matters or things stipulated" in the act.

While this appears to be fair legislation, it can hardly be hailed as advantageous to rubber manufacturers, some of whom use the words "pure gum," "pure rubber" or "pure Para" in describing their products, while others claim that their goods are "all rubber," or "contain nothing but pure rubber," when every rubber manufacturer knows that substances other than pure gum are necessary to the manufacture of all rubber articles. Should this bill become law it would make amenable anyone using phrases of the character quoted in publicity work of any kind, and despite the fact that the rubber trade understands the technical meaning of such terms as "pure gum" or "pure rubber" the manufacturers using them could be indicted under the provisions of this act and subjected to the expense of defending themselves, were dissatisfied purchasers or competing firms disposed to enter complaint against them.

The rubber business is not exceptional in that some of its nomenclature may be misleading. "Solid gold" jewelry contains a smaller or larger proportion of alloy; also "all wool" fabrics frequently contain shoddy and are not less satisfactory in wearing quality than others similarly designated but which contain a certain proportion of cotton. It is admittedly difficult to frame any law incapable of imposing hardship upon someone, and while the Barkley bill is right in principle, it may hamper manufacturers who use perfectly well understood terms in describing, labeling and advertising their products.

We do not fear the effects of this bill as far as the rubber trade goes, for its nomenclature is elastic and easily adjusted to new conditions. But to the class of men to whom the framer of the bill belongs, is it not a menace? A Congressman is, of course, a "product." If, therefore, any word such as "statesman" be placed upon him, and it be "false, fraudulent, or misleading" may he not be indicted and suffer the very penalty intended for the merchant?

RUBBER STRATAGEMS OF THE BLOCKADE.

IN all times blockade running has developed superlative ingenuity, and the present world conflict is no exception. England was quick to appreciate the value of her great navy and to realize that the most effective way to counter Germany's military preparedness was to use it to suspend German shipping, close German ports to the world and thus cut off all outside sources of important raw materials, such as rubber, copper, cotton and similar commodities not found or not produced in sufficient quantity within the borders of the Central Powers.

During the early months of the war considerable quantities of these materials were purchased by German agents in America and elsewhere and consigned to similar agents in the neutral countries of Europe, whence they subsequently found their way into Germany. But this subterfuge was not long permitted to continue after these neutral countries had exceeded their normal yearly importation. The contraband list was extended to embrace all these commodities, and cargoes including them were seized and in due course confiscated to Allied use by prize court proceedings. Meanwhile a constantly increasing shortage rendered the demand more urgent, and finally German agents found it necessary to resort to stratagem with all the ingenuity and resourcefulness characteristic of their race. That they so rarely succeeded, however, indicates no lack of initiative on their part; indeed, their adroitness was of an order to elicit admiration, but the examining officers of the British navy quickly developed a correspondingly keener intuition and an unyielding incredulity that brought many strange things to light in their thorough search of all vessels bound for European ports.

Obviously rubber lends itself very readily to clever faking and so has become the chief masquerader among contraband goods. It has been found in the guise of rusty iron hoops, toys, sponges and the inside filling of various articles, from tinned meats to broom handles. On one ship 4,000 packages, supposedly bread for British prisoners in Germany, were found to contain a pound of rubber each. Another vessel carried 17 tons of coffee beans in 250 sacks in which large quantities of crude rubber were concealed. One item of a miscellaneous cargo consigned to a neutral port consisted of many sacks of onions of excellent appearance, but when the examining officer selected one at random and dropped it on the deck it bounded back into his hand. Only a few, carefully spread over the top of each sack were genuine; the others had been made of rubber, and remarkably realistic imitations they were, too. Far more ingenious, though, were many cases labeled "pure honey." These were filled with the familiar little square boxes of comb with what appeared to be honey oozing out of it. An inquisitive sailor tasted of it, made a grimace and threw the box to the deck where it bounded about in the most surprising manner. The combs had been fashioned out of rubber and filled with some convenient smeary substance resembling honey yet not tasting like it.

Bulkheads and decks of somewhat more than normal thickness were several times found to contain contra-

band. In two instances, at least, it was discovered clamped to the bottom of a ship along her keel. Hollow steel masts were a subtle feature of one tramp steamer and her double bottoms were also stuffed with contraband, but these proved to be much less secure hiding places than the hollow furniture and bunks like conjurer's trick boxes which were afterward detected on an innocent looking trader. These are only a few of the many artful ruses that failed; of those that succeeded, and there were some—perhaps many, there is no record.

THE A. L. A. (THE AUTOMOBILE LEGAL ASSOCIATION) is a valuable organization; is strong, alert, and uniformly sane, but is the following, which is an official utterance, up to its usual standard?

The automobile journals and magazines are beginning as usual at this time of the year to carry a great deal of advertising space relating to tire treads or other devices intended to protect the tire, but we now feel that we can safely say that they are not satisfactory, and that the alluring advertisements referred to should not be considered.

Our experience is that rubber anti-skids prevent slipping except in deep mud or sand. While a few years ago they wore smooth after about 500 miles on the road, today they last from three to six thousand miles, when the tires become smooth.

MAKERS OF LEATHER FOOTWEAR COMPLAIN THAT DAMP weather, that for example which July and August of this year afforded in great abundance, spoils their work, as the rubber cement fails to stick. Their troubles are light, however, when compared with those of rubber manufacturers. Their work is full of building up by cementing, and prisoned dampness not only prevents proper adhesion, but results in blisters. The ideal making up room of the future will undoubtedly be supplied with air always of certain temperature and always free from moisture. This indeed is already done in dipped goods plants.

TWENTY YEARS AGO THE RUBBER CHEMIST WAS A *raya avis*. To-day he is an important, often the most important, member of the staff of experts attached to every successful rubber factory. In the last five years chemists have practically revolutionized compounding and reclaiming, and have but touched the edges of the great field of accomplishment. That they should meet and exchange views at the approaching National Exposition of Chemical Industries to be held in New York, the week of September 25, is eminently fitting, and a large attendance is assured.

THE NUMBER OF RUBBER WORKERS IN NEW YORK STATE increased 23.75 per cent in four months of 1916, as against a corresponding period in 1915. For the same term the wage increase over that of 1915 was 36 per cent.

Plantation Rubber in Cochin China.

By Lawrence P. Briggs, United States Consul at Saigon, French Indo-China.

THE production of plantation rubber is a comparatively new industry in Cochin China. Several years after Ceylon, Java, Sumatra and the Federated Malay States were producing rubber in considerable quantities, it was thought that Cochin China lacked the requisite soil and climate for the successful cultivation of the rubber tree. The first real plantation was established in 1900. In 1908 the first plantation rubber was exported from Saigon. About this time several large plantations were established. In 1915 the port of Saigon exported over 350,000 kilos of plantation rubber, with a customs valuation of over \$300,000 (United States currency), but with a market price nearly twice that figure. On the first of January, 1916, there were in Cochin China about 100 plantations, with a total of nearly 70,000 hectares and over five million trees, of which only about 400,000 have yet been tapped. It needs only the normal exploitation of the trees already planted to make plantation rubber in 1920 second in value to rice among the exports from Saigon.

WILD RUBBER.

For many years Saigon has exported native rubber—years ago in much greater quantities than now. This rubber was brought from the forests of Cambodia and Laos by natives, who obtained it from several varieties of wild trees and tropical lianes, especially the *Ecdysanthera Andulifera*. These lianes are tapped by making, with a knife or other sharp instrument, longitudinal slits in their vine-like trunks, in which the latex or sap is coagulated. After coagulation these strips of rubber are smoked on the tree, then rolled into a ball. This trade has declined greatly during the past few years, partly because the easily available trees were nearly ruined during the years of high price and partly because from 1912 until recently the price has not been sufficiently great to make it worth while to transport this product the necessary distance. The exportation of native rubber during the years 1899-1915, inclusive, has been as follows:

Year.	United States Kilos.	United States Currency.	Year.	United States Kilos.	United States Currency.
1899.....	1,513	\$722	1902.....	1,414	\$12,057
1900.....	19,491	37,688	1909.....	3,185	2,629
1901.....	26,256	97,689	1910.....	9,135	7,628
1902.....	14,767	18,525	1911.....	67,995	50,053
1903.....	7,692	9,649	1912.....	60,055	60,841
1904.....	12,848	16,118	1913.....	61,248	51,914
1905.....	37,724	47,325	1914.....	72,337	61,200
1906.....	57,443	84,607	1915.....	5,778	4,078
1907.....	34,137	43,823			

Rubber in 100 pounds. Hectare is 2.47 acres. Franc is 1/5 cent. Pounds is about 1/2 cent.

BEGINNINGS OF PLANTATION RUBBER.

There is some dispute about the exact time and place of the introduction of plantation rubber (*Hevea Brasiliensis*) into Cochin China. Old pioneers recall that a few rubber trees were planted in the Botanical Gardens at Saigon in 1880 or 1881, but these trees seem to have disappeared within four or five years from that date. According to the best authorities the rubber tree was permanently introduced into Cochin China in 1897 by M. Raoul, chief pharmacist for the Colonies. During a visit to Ceylon this official sent to the Saigon Botanical Gardens several thousand seeds. From these seeds about 1,800 plants appeared in 1898. In October of that year, 1,000 plants were sent to the government experimental station at Ong-Yem in Cochin China, 200 were sent to Dr. Yersin, director of the Pasteur Institute at Nha Trang in southern Annam, and a few hundred were distributed among various planters of Cochin China.

The rubber plantation at the Ong-Yem experimental station still continues. Less than 400 of the original trees survive, but new plantings on this and the adjoining plantation of the House of Correction raise the present number of trees to 16,500. The joint production of these two plantations for 1914 and 1915 is said to be about 3,700 and 6,000 kilos, respectively. Dr. Yersin's plantation at Suoi Giao near Nha Trang is more extensive. This plantation now consists of about 60,000 trees. Its production during the various years since tapping began is shown in later pages of this report.

The next year (1899) several thousand seeds were imported from Ceylon and the plants were distributed among various planters. The first successful plantation was established by M. Francois Belland, at that time chief of the Saigon police. In 1900, this colonist planted 600 trees on his plantation at Phu Nham, about three miles from Saigon. The next year he planted 4,500 more, and in 1902 another 9,000. This plantation, with that of Hanh-thong-tay a few miles away, purchased later by M. Belland, contains about 25,000 trees. The first tapping, in 1908, yielded about 1,500 kilos of rubber. This amount has been gradually increased, especially during the past two or three years. Nearly all the plantation rubber exported from Saigon before 1913 came from the Belland plantations.

DEVELOPMENT OF RUBBER PLANTATIONS, 1907-1916.

The plantations at Phu Nham and Ong Yem were located on



MAP OF FRENCH INDO-CHINA.

the narrow strip of gray soil which marks the first elevation from the delta-lands and flood-plains of which lower Cochinchina is composed. Above this gray strip lies a wider strip of red soil of volcanic origin and of remarkable fertility and depth, reaching in some places 20 or 30 feet. This strip, about 35 miles wide, begins in the upper end of the province of Baria and extends 60 or 70 miles north-west across the provinces of Bien Hoa and Thudaumot and into the protectorate of Cambodia.

In 1907 and 1908 two companies were organized to make more ambitious attempts to cultivate *Hevea Brasiliensis* on plantations located within the red soil area. In the former year the Société Agricole de Suzannah was organized with a capital stock of 2,500,000 francs, divided into 10,000 shares of 250 francs each. The same year this company planted 700 trees on their plantation near the station of Dau Giay on the Saigon-Nha Trang railway in the province of Bien Hoa, about 45 miles east of Saigon. The number of trees was increased to 45,000 in 1907, 140,000 in 1909 to 300,000 in 1910. The first tapping took place in 1912, when the production amounted to 4,480 kilos. In 1913 this plantation produced over 24,000 kilos of rubber. Since that time it has been, next to Xa Trach, the most productive rubber plantation in Cochinchina.

In 1908 the Société Anonyme des Plantations d'Héveas de Xa Trach was formed with a capital stock of 2,300,000 francs and purchased a plantation at Xa Trach, about 65 miles north of Saigon, in the province of Thudaumot. The first year 100,000 trees were planted. This number was increased to 200,000 in 1909 and 250,000 by 1915. In 1911, 540 trees were tapped; in 1912, 15,300, and in 1913, 54,000. The production of this plantation during the latter year was 25,170 kilos. It has since remained the most productive of the Cochinchina rubber estates.

The years 1908 and 1909 witnessed the creation of two large plantations on the gray soil strip near Saigon. In the former year the Société des Héveas de Tay Ninh planted about 8,500 trees in the province of the same name, about 40 miles west of Saigon. In the latter year the Société des Héveas de Tan-thanh-dong planted about 55,000 trees on their plantation in the province of Giadinh, a few miles distant from the capital. Although the development of these plantations has been slower than that of those in the red-clay strip, the figures given in later pages of this report show them to be among the most important plantations of the colony.

The four following years (1909-1913, inclusive) saw the formation of many companies and the rapid absorption of the best available lands for rubber cultivation. The most important of the companies formed at this time is the Société des Caoutchoucs de l'Indochine. This company, controlled by the Banque de l'Indochine, has a capital of 4,500,000 francs and its headquarters at Paris. Its plantation is located at Loc Ninh in the red-soil district, a few miles beyond Xa Trach. Besides being considerably the most ambitious attempt at rubber cultivation in Cochinchina, this plantation is notable as being the first successful attempt to interest, on a large scale, the capital of the mother-country, the earlier plantations being controlled almost entirely by local capital.

By the year 1913 the rubber industry can be said to have become firmly established in Cochinchina. By this time the total surface planted to rubber trees amounted to about 14,000 hectares, the number of trees planted was over 4,000,000 and the capital invested not less than \$5,000,000. In this year the older estates were beginning to yield and the exportation rose to about 85,000 kilograms.

The next three years, 1913-1915, inclusive, saw the development of old plantations rather than the creation of new ones. This was partly due at first to the decline in the price of rubber, partly to the fact that the most available lands had been taken up and partly, later, to the war. But the productivity of the later large estates is just beginning to assert itself. On January 1, 1916, there were in Cochinchina and adjacent territory in Annam and

Cambodia over 70,000 hectares in rubber plantations, of which over 17,000 hectares were planted to over 5,000,000 trees. Over 400,000 trees had been tapped, about 440,000 more were to be tapped during 1916 and the production for 1916 was estimated at over 700,000 kilos. The amount of capital invested is placed at more than \$6,000,000.

CHOOSING A RUBBER PLANTATION IN COCHIN CHINA: CLIMATE, SOIL.

In beginning a rubber plantation the first step is to choose a location, the second to get possession of the land. In choosing a location the primary questions are those of climate and soil. Transportation, difficulty of clearing the land and the labor problem are questions to be solved later.

The question of the right amount of water is an important one in Cochinchina. The plantation must have sufficient elevation to avoid the annual floods of the delta region and to afford quick drainage after the annual rains. Many of the trees first planted at Ong-Yem were drowned out during the wet season. On the other hand, the extreme dryness of the years 1911 and 1912 wrought serious handicap to those plantations where irrigation was impossible or insufficient. Then, temperature seems to count for something. There is a point along the coast of Indo-China above which the rubber tree cannot be successfully cultivated. This point seems to be about the 13th parallel north latitude, just north of Nha Trang. The only plantations above this line are those of Delignon Freres near Qui Nhon, in Annam, about 14 degrees north, and still in the experimental stage. Another peril along the coast of Annam is the typhoon. The typhoons of 1909 and 1912 seriously damaged and plantation of Suoi Giao near Nha Trang.

Experiments show the soil of Cochinchina to be well adapted to the growth of the rubber tree. A physical analysis made in the laboratory of the Saigon Botanical Gardens of the red lands of Bien Hoa at 100 degrees shows the following compositions:

Sand	478.40
Clay	438.10
Organic matter	67.72
Perforous gravel	7.15
Carbonate of lime	6.16
Vegetable mould	2.38

1,000.00

Chemical analysis of this soil made at the same time and under the same conditions shows the chemical composition indicated in the first column of the following table. The other columns show the composition of red soil taken from plantations in the province of Thudaumot (Xa Trach) and Baria (Arcillon) and an average of seven analyses taken from various parts of Cochinchina:

	Bien Hoa.	Thudaumot.	Baria.	Average of 7 Analyses.
Azote	1.81	1.33	.92	1.01
Phosphoric acid	6.70	1.65	5.21	7.22
Potash	1.62	1.10	.59	.62
Lime	3.44	.30	.25	.75
Magnesia	2.49	.35	.59	.39

An analysis under the same conditions of the gray sandy soil of the older plantations shows the following composition:

	Province of Giadinh. Plantation Josseline.	Thuduc.	Thudaumot. Ong-Yem.
Azote .....	.85	9.310	.404
Phosphoric acid .....	.159	.107	.347
Potash .....	.510	.796	.510
Lime .....	.641	.196	.796
Magnesia .....	.550	.350	.100

These analyses show the red soil to be very rich in phosphoric acid, above the average in azote, but sometimes slightly deficient in potash, lime and magnesia. These deficiencies may be supplied by the occasional use of a small amount of artificial fertilizers. The gray solids, on the other hand, have an abundance of potash, lime and magnesia, but are wanting in azote and phosphoric acid. The lacking substances have been supplied by the application of stable manure and oil cakes.

In practice the red soil has proven richer in the elements necessary for the development of the rubber tree, and colonists who are able to choose are locating their plantations in the red soil strip.

(To be continued.)

In the sandy districts of the Congo Free State and of Angola, the so-called "grass" and "prairie" rubber is obtained from the rhizomes of plants which, though not vines, are also called *Landolphia owariensis*, especially the *Landolphia Henriquesiana*.

On the east coast, in German East Africa and Mozambique, there is also a species of this kind, the *Landolphia Kirkii*, which

is the most common and most important of all rubber vines.

Finally, in Madagascar, the red rubber of the east coast, from Vohémar to Farafangana, is produced by the *Landolphia Madagascariensis*, and the pink rubber from the Boina and the Menabe districts, on the west coast, is from the *Landolphia speciosa* and the *Landolphia Perrierii*.

The Largest Rubber Tree.

A CORRESPONDENT in Los Angeles, California, sends us a picture of what he confidently affirms is the largest of all rubber trees. According to his description, the branches cover a space about 112 feet in diameter. The body of the tree at its thickest point measures about 14 feet in circumference, while each lower limb is about 8 feet in circumference. The tree is not a tall growing variety, but is probably 60 feet in

height. The roots spread over the ground for quite a space around the body, giving it an odd appearance. The leaves are about 6 inches long by 3 inches wide and are rather thick. They contain a milk-like juice, that soon condenses and a gummy web is formed.

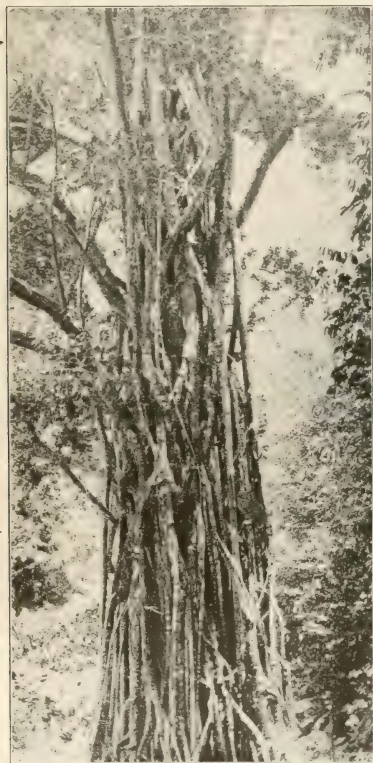
It has been estimated by a prominent expert on rubber that this tree would make over 100 standard size tire casings.

Speaking of rubber trees, as far back as 1852, Daniel Webster in the great India Rubber Suit committed himself thus:

It (india rubber) is a gum procured from an equatorial tree found in greater or less quantities in Brazil, and called by botanists *Ficus Elastica*. . . . It is said to be, in some of its specimens, the largest tree growing on the face of the earth. There are instances in which it is described as being nearly a hundred feet in circumference.

He was in error, of course, in several errors; but the *Ficus Elastica* is the world's big rubber tree. Not in Los Angeles, nor in Brazil, but in Sumatra.

There on the West coast in the town of Siboga is a really big tree. It is 196 feet high, and 180 feet in circumference, 5 feet



GIANT *FICUS ELASTICA* IN SUMATRA.



FIG *FICUS ELASTICA* IN LOS ANGELES, CALIFORNIA.

from the ground, or 60 feet in diameter—nearly thirteen times as big as its California cousin. It has given as much as 100 pounds of rubber in a year. In the accompanying illustration three natives may be seen high up on the trunk of the tree, showing graphically its enormous size.

USES OF PERFORATED RUBBER SHEET.

Perforated hard rubber sheet is used in storage batteries and also for screening certain substances. Perforated sheet rubber packing is used quite extensively in canning factories for grading green peas after they have been shelled. The soft rubber screen does not injure the peas. Perforated rubber sleeves are sometimes used on driving pulleys to prevent belt slipping.

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WERNER, RUBBER CO., Gordon Ind. Donald C. Fisher, Milwaukee, Wis.; A. F. Fisher, St. Louis, Mo.

CHARLES T. WILSON CO., INC., New York City—Samuel Lund, Corona, N. J.; Hugo Hauff, Newark, N. J.

WILSON, S. S. H. & CO., Trenton, N. J.—*Factory Representative* J. E. Hunt, Philadelphia.

CHEMICAL EXPOSITION AND SOCIETY MEETINGS.

THE Second National Exposition of Chemical Industries, to be held at the Grand Central Palace, New York City, during the week of September 25-30 will call together chemists and those engaged in many allied industries from all sections of the country. A number of chemical societies have chosen this city and the above date for their regular or special meetings.

The section of Rubber Chemistry will gather at the same time, and a general conference on the progress of chemistry of india rubber will be held. This section will be under the chairmanship of Dr. Lothar E. Weber, of Boston, Massachusetts. J. B. Tuttle, Bureau of Standards, Washington, District of Columbia, is the secretary. It is expected that some interesting papers will be presented at this meeting.

The Chemists' Club, who will also have headquarters at the exposition, have offered the lobby of the clubhouse for the registration of the members of the society. The Chemists' Club, which is a few squares from the Grand Central Palace, has been selected as the headquarters of the American Chemical Society, and on Monday afternoon the council of the American Chemical Society will hold a business meeting there, followed by a dinner tendered to the council by the New York Section. This society will also conduct a symposium on occupational diseases presided over by Professor Charles Baskerville, head of the department of chemistry of the College of the City of New York. Among the subjects treated will be the avoidance of contamination of the air in rubber factories by the fumes of bisulphide of carbon; the avoidance of and remedy for lead poisoning, and diseases or troubles incidental to work in rubber factories. A general discussion will be held by leading authorities of the country, including Drs. W. Gilman Thompson, F. L. Hoffman, A. W. Scherschewsky, G. P. Adamson, H. K. Benson, W. A. Lynott, Alice Hamilton, and J. B. Andrews.

MEETING OF THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS.

The semi-annual meeting of the National Association of Cotton Manufacturers will be held September 14-16 at The Griswold, New London, Connecticut. Besides the usual business of the association there will be many interesting papers read, a golf tournament and a banquet at which questions of national importance to the cotton industry will be discussed by eminent speakers.

TOY MANUFACTURERS FORM ASSOCIATION.

Toy Manufacturers of the U. S. A., Inc., is the name of an association recently incorporated, the objects, as explained in its constitution, being to cooperate with and help toy merchants in every conceivable way; to exchange ideas on matters pertaining to manufacturing problems; to protect the members in the matter of credits by exchange of information; to take an interest in all legislation affecting the toy industry, and to carry on a national campaign of advertising to acquaint the public with American-made toys. The manufacture of rubber toys is an important branch of the rubber industry and it is likely that manufacturers of such goods will consider it to their interest to join the association, which has an office at 200 Fifth avenue, New York City. The officers are as follows: A. C. Gilbert, president; Harry C. Ives, A. D. Converse, vice-presidents; Leo Schlesinger, treasurer, and Fletcher D. Dodge, secretary.

What the Rubber Chemists Are Doing.

VARIABILITY IN VULCANIZATION OF PLANTATION PARA

AN important study of the cause of variability in respect to the rate of cure of plantation Para is being conducted by B. J. Eaton and J. Grantham in the chemical laboratory and experimental vulcanizing factory, Department of Agriculture, Federated Malay States.

THE INDIA RUBBER WORLD, October, 1915, page 11, and December, 1915, page 114, presented abstracts of the first communication on this research. The second communication, published in "The Journal of the Society of Chemical Industry" (June 15, 1916) is abstracted below.

In their previous paper, the authors indicated that the primary cause of variability in rate of cure was attributable to the accelerating action of a small quantity of some substance existing in the latex or produced subsequently in the raw rubber from some constituent present in the latex.

Subsequent experiments have been directed to ascertaining the nature of this substance and its behavior under different treatments, to determine its probable constitution. These efforts have resulted in the isolation or preparation of a substance or substances from the latex serum to which acceleration in rate of cure can be attributed, and evidence has been obtained of the presence of a second substance which also has a similar effect.

The experimental results of the present paper confirm the theory that the rate of cure is influenced by the amount of an accelerating agent formed by the decomposition of some constituent of the latex, and that this substance is a decomposition product of the protein or nitrogenous constituents of the latex, produced usually in the freshly coagulated raw rubber by the action of micro-organisms, which gain access to the latex after it leaves the tree, or possibly in some cases decomposition by chemical action. The retarding effect of smoking, on the rate of cure, has proved to be a more complicated problem than at first appeared. The retarding effect, though invariably shown by slab, has been found not to be constant in sheet, especially in thin sheet. This is due to the fact that, in smoking rubber, more than one variable factor, influencing the rate of cure, is present.

In most of their experiments the authors used raw rubber in the form of slab slightly pressed, or unpressed coagulum containing a large percentage of serum. The latex was coagulated one day about noon, left in the serum till about 10 A. M. the following day and then rolled under a wooden rolling pin on a sloping table. All samples were eventually converted to thin crepe before vulcanizing. In order to demonstrate that the differences obtained by the authors in their experimental samples were not a special feature of the latex or rubber prepared in their factory, their methods of preparation were repeated for them on different estates, with identical results.

The authors present their investigation in three divisions:

PART I.—EXPERIMENTAL

Part I embraces a group of experiments for determining—The time necessary to develop the change in slab rubber, causing an increase in rapidity of cure.

The effect of antiseptics, heat and cold.

The effect of formalin.

The effect of soaking in running water.

CONCLUSIONS IN ORDER OF

1. That the rate of vulcanization of rubber from any given latex is determined by the extent to which a certain change takes place subsequent to coagulation.

2. This change is normally limited to the first few days after coagulation. The change is progressive and regular, increasing

in "slab" rubber (i. e., coagulum containing a large proportion of the serum) in approximately six days after coagulation.

3. The change can be arrested either partially or completely by the action of formalin, heat, and cold. It is also arrested by crepeing shortly after coagulation, which may be due either to the larger surface exposed or to the more rapid drying, or both, combined with the removal of most of the serum in machining to crepe form.

4. The complete arrest or inhibition of the change by formalin (similar effects have been obtained with other antiseptics) and by the action of both heat and cold, indicates the formation by biological action of a substance which increases the rate of cure of raw rubber, the decomposition being probably of an anaerobic nature. There is no evidence that the change is due to chemical agencies.

In this connection experiments carried out on latex frozen for several days at 12 to 15 degrees F., are of considerable interest, since by freezing for this period, the rubber no longer cures rapidly, even if left for a considerable period afterwards at 84 degrees F.

[The method of freezing latex to produce rubber has been patented in the Federated Malay States. Latex after freezing for 4 to 5 hours is coagulated and, on thawing the solid block thus formed, a solid coagulum is formed, whereas latex can be frozen for a short period and on thawing is reconverted into latex.]

PART II.—EXPERIMENTAL

Part II deals with the probable nature of the constituent of the latex involved in the changes in raw rubber, and the nature of the constituents which are responsible for the variations in rate of cure of different rubbers.

The experiments of Part II included the addition of proteins to rubber and the effect was determined of the following additions:

Casum and peptone.

Decomposed casum.

Protein from the latex.

Evaporated serum minus protein.

Decomposed protein from serum.

CONCLUSIONS UNDER PART II.

It is apparent from these experiments that there exist in the serum two substances: (1) a substance of the nature of protein, precipitated or coagulated by heat, which is ineffective in accelerating the rate of vulcanization unless decomposed; (2) a soluble substance, only obtained by evaporation and not easily decomposed, which has itself an accelerating action or vulcanizing power.

Decomposed precipitated protein is effective in much smaller quantity than serum residue obtained by evaporation, after the heat coagulated protein has been removed.

In the ordinary preparation of sheet and crepe rubbers the greater part of the serum is removed in machining the coagulum, and the whole of the soluble products may be washed out in crepeing, so that normally the accelerating effect of the soluble serum is nothing. All of the experiments of the first part show the gradual development of the accelerating substance during the first few days after coagulation. This is attributed to the decomposition of protein (similar in nature to that precipitated from the serum by heat) which is precipitated with the rubber during coagulation.

PART III. ANALYTICAL NITROGEN CONTENT OF RUBBER AND THE RATE OF VULCANIZATION

The contrast between the high nitrogen content of a slow-

curing crepe, compared with the low nitrogen content of fast-curing crepe from a slab rubber, can only be explained on the theory that, in the slab rubber, decomposition of the protein or nitrogenous substance takes place. A soluble portion is washed out during crepeing, and the insoluble residue, or part of it, is presumably the substance causing acceleration in rate of cure in the case of slab rubbers.

In view of the vulcanizing results obtained in Parts I and II, the authors have analyzed a large number of their samples which are tabulated below, together with the rate of cure determined by the load-stretch curve method.

Per Cent of Nitrogen in Dry Sample.	Optimum Time of Cure in Hours.	Per Cent of Nitrogen in Dry Sample.	Optimum Time of Cure in Hours.	Per Cent of Nitrogen in Dry Sample.	Optimum Time of Cure in Hours.
0.31	1.0	0.24	1.0	0.28	1.0
0.26	1.0	0.19	1.0	0.22	1.0
0.19	1.0	0.22	1.0	0.31	1.0
0.16	1.0	0.26	1.0	0.19	1.0
0.17	1.0	0.26	1.0	0.24	1.0
0.17	1.0	0.18	1.0	0.24	1.0
0.18	1.0	0.28	1.0	0.24	1.0
0.18	1.0	0.20	1.0	0.24	1.0
0.33	1.0	0.26	1.0	0.24	1.0
0.30	1.0	0.26	1.0	0.24	1.0
0.16	1.0	0.26	1.0	0.26	1.0
0.11	1.0	0.26	1.0	0.36	1.0
0.13	1.0	0.26	1.0	0.26	1.0
0.12	1.0	0.26	1.0	0.26	1.0
0.13	1.0	0.26	1.0	0.26	1.0
0.18	1.0	0.26	1.0	0.26	1.0
0.17	1.0	0.26	1.0	0.26	1.0

In every case, the amount of nitrogen in a slow-curing rubber, is about 50 to 100 per cent greater than the amount of nitrogen contained in a fast-curing slab rubber, the amount of nitrogen being determined on all samples after conversion to crepe and drying.

On the other hand, the amount of nitrogen in samples of rubber prepared by the evaporation of thin layers of latex, or by pouring out the latex into thin layers, after addition of acid coagulant, and allowing the thin sheets thus obtained to dry rapidly, is high, and amounts in some cases to 0.5 per cent. Such samples are rapid curing, although the percentage of nitrogen indicates that no decomposition of the protein or nitrogenous constituents of the rubber has taken place, the factor deciding rapidity of cure being apparently, in this case, the unknown substance present in the evaporated serum after removal of the major portion of the protein.

SUMMARY.

1. The experiments and results of Part I show that one factor which causes variability in respect of rate of cure in plantation Para rubber is produced during the first six days after coagulation and that the change which takes place in the coagulum is progressive during this period, while after this period, no further change, under ordinary conditions, takes place.

2. The action of antiseptics, such as formalin, as well as heat and cold, are also shown to inhibit this change, while soaking of the fresh coagulum in running water considerably retards the rate of cure.

3. The action of formalin is also shown to be partly, though not to any great extent, an action on the accelerating agent after its formation.

4. Experiments on the cold storage of freshly coagulated rubber show that while the change which produces rapidity of cure is inhibited as long as the coagulum remains in cold storage, if the rubber is removed again and allowed to remain, without machining, for a further period (13 days or possibly less) at ordinary atmospheric temperatures (about 85 degrees F. in the Federated Malay States), rapidity of cure is again brought about.

5. All the experiments of Part I suggest that the change which produces rapidity of cure in the rubber is caused by biological agencies, that is to say, micro-organisms entering the latex after collection and remaining in the coagulum, and that the change is probably a decomposition of the protein or nitrogenous sub-

stances present in the coagulum, producing an accelerating agent which is a decomposition product of the proteins.

6. The experiments of Part II, on the slow-curing rubbers of various proteins and nitrogenous substances, and their decomposition products, including the proteins from the latex serum, decomposed by suitable methods after separation from the serum, confirm the conclusions from the experimental evidence contained in Part I, and show that the original proteins have little or no effect under the conditions employed, while the decomposed proteins have a marked effect.

7. Experiments with undecomposed evaporated serum, after separation of the proteins coagulated by heat, suggest the presence of a second factor which accelerates the rate of cure, and is due to some substance originally present in the latex.

8. In the case of the authors' so-called "slab" rubbers, possibly both factors are responsible for the acceleration of the rate of cure, and it would appear that the second factor may be responsible for the actual superior tensile properties of the rubber. Some evidence to this effect is contained in the comparatively poor quality of the rubbers to which the protein decomposition product has been added, in which the second factor has been removed, and also in the good quality in the case of the evaporated latex samples and the rubber to which the evaporated serum has been added. Further experiments are, however, necessary to confirm this.

9. Experiments with evaporated latex, which contains all the serum constituents and is dried with sufficient rapidity to prevent decomposition of the proteins, also confirm the presence of this second factor.

10. The nitrogen figures given in Part III still further confirm the decomposition theory, that is to say, the production of some substance from the protein which accelerates the rate of cure, the nitrogenous portion which becomes soluble in water and is removed on crepeing being non-essential. The high nitrogen content, on the other hand, in rapidly curing rubbers produced by evaporation of the latex, without decomposition of the protein, again confirms the evidence obtained as to a second factor which is probably of a non-nitrogenous nature.

11. These experiments and results also show why it has not been possible hitherto to connect the nitrogen content of a rubber with its rate of cure, since a rapidly curing rubber may have either a low or high nitrogen content, and indicate how previous workers have gone astray, or not gone sufficiently far in their investigations, in connection with the protein or nitrogenous constituents of latex and rubber.

12. Many other experiments on nearly 1,000 samples of rubber all confirm the above results and conclusions.

13. A further investigation is now being made as to the exact nature of the protein decomposition product, which accelerates the rate of cure, and as to the nature of the second factor responsible for acceleration, together with the numerous subsidiary factors which influence the rate of cure, a number of which have already been investigated.

The authors have since found that the protein left in sheet of average thickness can be decomposed and so produce a more rapidly curing sheet rubber by simply rolling up the sheets after machining in order to retain sufficient moisture content for the bacterial decomposition. This demonstrates that the rapidity of cure of the so-called slab rubber is largely due to the decomposition of protein nominally retained by the rubber, even after rolling to sheet form. These results also show the importance of the rate of drying during early stages, as a factor in the preparation of sheet rubber, in order to have a uniform rate of cure.

It is reported from France that the incendiary lozenges and asphyxiating gases the German army has been using so freely are due to the work of Dr. Wolfgang Ostwald, the well-known German chemist and editor of the "Kolloid-Zeitschrift."

VULCANIZATION OF CAOUTCHOUC AND ITS REGENERATION.

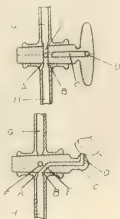
THE chemical investigation of the vulcanization of caoutchouc and the possibility of its regeneration from the vulcanized product is the subject of a paper by I. C. Harries in "Berichter," 1916 [Vol. 49, pages 1196-1201]. In the ordinary hot vulcanization process with about 10 per cent of sulphur, two distinct stages must be differentiated. The primary action is an absorption phenomenon, since the sulphur can be extracted practically quantitatively with a solvent such as acetone, and, moreover, does not pass into the derivatives, such as the hydrochloride, which contains only a trace of sulphur, although, unlike the hydrochloride of natural caoutchouc, it is quite soluble in chloroform. On the other hand, a vulcanized caoutchouc which has been kept for a long time in a warm place, contains from 2 to 4 per cent of sulphur, which resists the action of solvents, and it also gives a sulphur-containing hydrochloride. The vulcanization of caoutchouc is accompanied by a change from the metastable form of the natural caoutchouc to a stable form, a change which is accompanied by the above mentioned difference in solubility between the hydrochlorides of the natural caoutchouc and of the caoutchouc obtained by desulphurizing the vulcanized product. In chemical structure both forms are apparently identical, although the stable form is more slowly attacked by ozone, and in their solubility relationships they behave very differently. The desulphurized vulcanization product cannot again be satisfactorily vulcanized. This is not due to the extraction by the acetone of a substance which favors the vulcanization, as Harries had previously supposed, but rather to the fact that a regeneration of the caoutchouc or reconversion to the metastable form is an essential preliminary to revulcanization. Theoretically, the desulphurization is but a secondary consideration.

LABORATORY APPARATUS.

AUTOMATIC PIPETTE.

AN automatic pipette for which Alexander Lowy, of the Commercial High School, Brooklyn, New York, has applied for a patent, is shown in the illustration, as relates to the stop-cock, which is the improved patentable feature. The valve or stop-cock is placed in the tube.

With suction applied at end of the tube *G* the liquid is drawn upward through tube *H* until it just passes the graduation level *A B*. The opening *D* is then closed air tight by the thumb and the cock rotated 90 degrees, clockwise, establishing connection between *H* and *D* through passage *F C*. The thumb is then released and air pressure forces the exact measured volume of liquid from the pipette.



The advantages are summarized as follows:

1. Automatic control of exact measured volume of liquid in the pipette.
2. Obviates manipulating the exact volume of liquid once it has passed the graduation mark, placed where the stop-cock meets the lower end of the valve of the pipette.
3. Permits discharge of exact measured volume.
4. Ease of manipulation.

An instrument of the hydrometer type has been patented by T. Cockerill, Government Technical Schools, Colombo, Ceylon, for use in testing rubber latex. The graduations are marked in addition to or in place of the specific gravity numbers with the quantity of acid per gallon required to coagulate the latex, and also in some cases the number of ounces of rubber per gallon of the latex. [British patent No. 340,592.]

CHEMICAL TREATMENT OF RUBBER.

THE UNITED STATES.

PROCESS OF MAKING CAOUTCHOUC LIKE SUBSTANCES. The process consists in producing substances resembling or related to caoutchouc by shaking a butadiene hydrocarbon with an alkali metal and zinc balls in the presence of carbon dioxide and then, when a dark-colored mass has been obtained, adding a further quantity of butadiene hydrocarbon, and allowing polymerization to proceed, also in the presence of carbon dioxide. [Henry S. A. Holt, Ludwigshafen, Germany, assignor to Badische Anilin & Soda Fabrik, Ludwigshafen, Germany. United States patent No. 1,192,310.]

TIRE FILLER. A composition comprising raw rubber, 34 pounds; infusorial earth, 14 pounds; rosin oil, one pint; flour of sulphur, four pounds; air slaked lime, four ounces; carbonate of ammonia, two pounds; baking soda, one pound. [Edward L. Sherbondy, Los Angeles, California, assignor to Aero-Cushion Tire Co., San Jose, California. United States patent No. 1,193,196.]

CANADA.

RECOVERING RUBBER. A process for recovering rubber contained in rubbered fabrics, consisting in treating the fabrics with ethane tetrachloride, heating the fabrics during this treatment, filtering the resulting mass to remove the fabric, adding water to the filtrate and heating it to drive off the water and solvent. [La Compagnie Générale des Caoutchoucs de Térébenthine, Paris, France. Canadian patent No. 168,727.]

VULCANIZATION ACCELERATOR. Accelerating the vulcanization of natural or artificial caoutchouc or caoutchouc-like substances by vulcanizing them in the presence of paratrisodimethyl-aniline or its homologues. [S. J. Peachey, Manchester, England. Canadian patent No. 168,806.]

PLASTIC CHLORINE DERIVATIVE OF CAOUTCHOUC. Same subject matter as British patent No. 1,894 (1915). (See below). [S. J. Peachey, Manchester, England. Canadian patent No. 168,807.]

THE UNITED KINGDOM.

PLASTIC MATERIALS. Caoutchouc is treated with chlorine to form a plastic or solid material resembling celluloid or leather. The caoutchouc is first dissolved in carbon tetrachloride, or other solvent which does not react with chlorine, and which is a solvent for the product to be obtained, hydrocarbons being excluded. This solution, after treatment with chlorine or with a gaseous mixture containing chlorine, is evaporated or distilled. During chlorination the solution is jacketed with circulating cold water. In an example, 50 grams caoutchouc in 1,250 cc. carbon tetrachloride are allowed to absorb 100 grams of chlorine. Camphor, mineral fillers, or pigments may be added. [S. J. Peachey. British patent No. 1,894 (1915).]

CEMENT FOR APPLYING SHOE SOLES AND REPAIRING.—The cement is made by melting together 1 pound gutta percha, ½ pound caoutchouc, 2 ounces pitch or bitumen, 1 ounce shellac, and 2 ounces mineral oil. [R. M. Dobbie, Ayr. British patent No. 4,771 (1915).]

SWEDEN.

RUBBER SUBSTITUTE. Ordinary isoprene is polymerized by suitable substances at a temperature not above 374 degrees F. [Chemical Fabrik Co. Swedish patent No. 40,471.]

OTHER CHEMICAL PATENTS.

THE UNITED STATES.

- 1,191,580 Process of making condensation products from phenols and formaldehyde. Ludwig Beckmann, Amberg-Weiden, the Rhine, Germany.
- 1,191,496 Process of producing cellulose esters. Joseph Kortschuet and Max Baumgarten, Lyon, France, assignors to Société Chimique des Usines de Rhône, France.
- 1,191,497 Process of producing plastic substances from derivatives of alcohols. Theodor Lehmann and Johannes Stocker, Berlin, Germany.
- 1,191,493 Resinous products and method of producing same. J. E. A. McGon, Wilmington, assignor to Westinghouse Electric & Manufacturing Co., East Pittsburgh, both in Pennsylvania.

New Machines and Appliances.

A MODERN GRINDER AND MIXER.

LARGER and better machines are now being designed and constructed by rubber machinery manufacturers to keep pace with the steadily increasing requirements of the rubber industry. The accompanying illustration shows a modern type of mill now being manufactured for the grinding and mixing of rubber and is particularly adapted to handling tire stocks. The bed-plate is heavy and substantial, having twelve foundation bolts with the necessary plates, and is provided with two solid pedestals that are lined with babbitt metal and arranged for grease lubrication.

The housings and caps are made of semi-steel, of a rugged design for heavy duty, and the journal boxes which are also of heavy construction are provided with wide seats on the housings. Full bronze liners of special bearing bronze are fitted in the boxes, and arranged for direct water cooling circulation.

The rolls are not equal in diameter, one being 22 inches and the other 26 inches, while the length of both is 84 inches. They are made of chilled iron, the journals ground true, and bronze stuffing boxes with distributing pipes are furnished for controlling the temperature. The adjusting screws and nuts are of steel, easily removable at all times and provided with a locking device. Breaking cups for overloads are placed between the screws and boxes, and automatic cast-iron guides, compensating for the opening of the rolls, are mounted on the journal boxes. A bronze sight feed oiler and an accessible grease pocket are provided for each journal for the purpose of lubrication.

The shafting is of hammered steel turned true and smooth. Both drive gear and pinion have cut spur teeth, the gear being made of semi-steel in one piece; the steel pinion is made in halves with machined joint, and heavy holding bolts.

The connecting gears are of steel, and have cast spur teeth with staggered face. The connecting gears operate in a deep

sired. Many efforts have been made to remedy the trouble, which has always been an objection to the use of herringbone gears.

The use of any fixed end thrust causes too much constraint, and the lack of it allows the lateral motion due to the drift of the motor armature or any other external forces acting on the shaft to be transmitted directly to the pinion, with the disagreeable results before mentioned. Flexible couplings have been,



and are being, widely used with the idea of relieving the gears from these end thrusts and some form of connection between the motor and herringbone pinion was desired which would (1) transmit the necessary power; (2) leave the pinion free to align itself with the gear, and (3) leave the pinion unaffected by any end thrust, caused by lateral motion of the shaft.

Such a coupling has been recently designed, and is here shown, in connection with the well-known magnetic safety clutch which has been in use on calender rolls for some time.

The mechanical construction of the coupling is very simple, the principal object being to make the disks *D* strong enough to transmit the torque, and at the same time secure the utmost flexibility. It may easily be seen that the amount of torque transmitted is only dependent on the thickness of the disks, and the size of the bolts. The extensibility is only dependent on the flexibility of the disks, and is absolutely independent of the amount of torque transmitted, in that it is the same when no load is being transmitted as when the load is maximum.

In order to secure the utmost extensibility the disks are laminated, each disk consisting of several thin disks bolted together. The deflection of a thin circular plate under a given load varies inversely as the cube of the thickness. Three $\frac{1}{8}$ -inch disks will transmit the same torque as one $\frac{3}{8}$ -inch disk, but the three thin disks will deflect nine times as easily as the one thick disk. Practice has demonstrated the correctness of this theory, and in the case of a 32-inch coupling recently built, the force necessary to cause a deflection of a large part of an inch, was much less than the end sliding friction in the bearings.

While this coupling has only been applied to rubber calender work, where it has met instant approval, it is not limited to this field, and may be applied in any case where a truly extensible coupling is desired. [The Cutler-Hammer Clutch Co., Milwaukee, Wisconsin.]

EXTENSIBLE COUPLING FOR MILL DRIVES

All users of herringbone gears are familiar with the bad effect of end thrust, or any constraint which does not leave the gears perfectly free to align themselves. The resulting noise, vibration and wear are very objectionable, especially in the case of rubber calender rolls where a very smooth action is de-

PORTABLE MOTOR DRIVEN ALLIGATOR SHEARS.

Alligator shears are indispensable to the rubber scrap and reclaiming industries; moreover, the great variety of refractory material to be cut generally requires a heavily constructed and powerful shear. The illustration and description of the lighter portable type that follows are offered as a suggestion for doubt-



slush pan of cast iron and are enclosed by a heavy sheet steel cover provided with hand holes for inspection. A balanced bar with throw-out switch provides means for instantly stopping the mill in case of an emergency. [Farrel Foundry & Machine Co., Ansonia, Connecticut.]

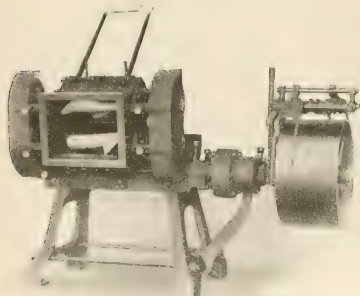
less so convenient a machine could be made useful in many rubber plants that do not reclaim rubber scrap. In fact it is now used in a large tire factory for cutting scrap tires to facilitate packing, prior to shipping to the reclaimer.

In the No. 1 machine the axes at both front and rear are so arranged that the tongue may be attached to either axle. Thus the machine is drawn to the scrap pile and when the cutting is over the tongue is attached to the rear axle and the shear drawn away. A special crank shaft and pitman permit a $7\frac{1}{2}$ inch opening at the widest point of the jaws.

This machine is made in both stationary and motor-driven types and requires only one man to operate it, making 50 cuts per minute with the expenditure of three horse-power. Thus it will be seen that considerable scrap can be cut in a day at very small cost. [The Canton Foundry & Machine Co., Canton, Ohio.]

NEW DRY COMPOUNDING MACHINE

A new type of masticator for dry compounding has been recently designed as the result of experiments tending to prove the theoretical superiority of a masticating blade over the ordinary compounding roll. Sufficient power, the chief requisite, especially for the higher grade compounds, has been considered in the construction, resulting in a much larger and stronger built machine. Another factor that makes for an enclosed machine is the increasing use of various forms of lamp black and other light substances for compounding, which have a strong tendency to fly about and cause considerable dirt and annoyance.



The following advantages are claimed by the manufacturers:
AUTOMATIC. The proper time for breaking down various gums can be determined by experiment and also the proper sequence for adding the ingredients and the time required to incorporate them completely into the compound.

LABOR SAVING. Owing to the fact that personal attention is not necessary to each machine between the various loadings, it is estimated that one man of ordinary intelligence can handle four machines.

MORE UNIFORM COMPOUND. As the compounding of the material is automatic in the machine, which not only has a compressing action but a kneading and mixing action, the ingredients are

thoroughly and uniformly incorporated into the compound, eliminating the personal equation in manipulation, a most important cause for lack of uniformity in the compound.

BETTER TEMPERATURE CONTROL. The outer shell or trough is jacketed, and the blades made hollow, if desired, so that the effect of steam, cold water or even brine can be applied to a very large surface of the material.

FLYING DUST CONTROLLED. The inconvenience of flying dust, so troublesome in the lighter compounds, can be controlled to a large extent, as the active blades are inclosed in a chamber or trough.

The size of the machine is considerably larger than the ordinary type, but it is claimed that it takes up considerably less space than mills of corresponding capacity.

The working capacity of this machine is figured at approximately 10 cubic feet per charge against $5\frac{1}{2}$ cubic feet, the charge of the regular masticator.

The power required will, of course, vary with the compound. The machine is designed to carry 125 horse-power without overloading, although it is estimated that the average demand will be from 65 to 80 horse-power.

The time of masticating must naturally be determined by experiment for each compound, but in experiments held up to the present time it has varied from half an hour to an hour.

A small machine having a capacity of about one cubic foot, on which this company has been conducting experiments at their Saginaw factory, will be exhibited at the Second International Exposition of Chemical Industries to be held at the Grand Central Palace the week of September 25. [Werner & Pfleiderer Co., Saginaw, Michigan.]

THE FREEMAN IMPROVED BLOCK PLANER.

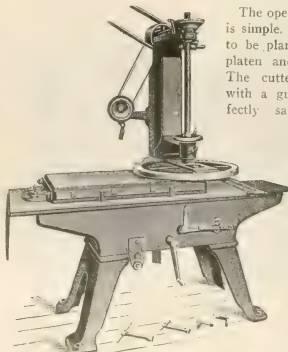
All manufacturers of rubber goods, using power cutting machines and wood cutting boards or die blocks, will find a planer or resurfacer a valuable and needed addition to their factory equipment.

The operation of the machine is simple. The board or block to be planed is clamped on a platen and fed automatically. The cutter head is covered with a guard, making it perfectly safe, and also acts as a part of dust collector and can be connected with the dust collecting system if that is available; if not, almost all the chips are collected and dropped at the side of the machine into a receptacle placed there for that purpose. By using this machine, blocks can be kept in good condition, effecting a

saving in blocks and practically eliminating sprung or broken dies.

The machine is self contained, having its own counter shaft with friction pulley. It has a locking lever to start and stop, automatic feed in either direction and a knife grinding attachment.

It is built in the following sizes for the rubber trade: No. 0 will plane boards or blocks 4 feet long, 24 inches wide and 24 inches high, while Nos. 1 and 2 will plane boards or blocks 6



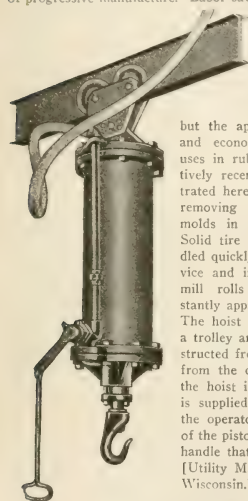
feet and 9½ feet long respectively, and 24 inches in width and height. A four-foot block can be planed in two minutes so that the labor is a small item. [The Louis G. Freeman Co., Cincinnati, Ohio.]

THE UTILITY AIR HOIST.

Progressive methods in modern rubber mills require progressive equipment to successfully carry out in practice the principles of progressive manufacture. Labor saving is the constant watch-

word of the executive, superintendent and department foreman, who know the value of time and energy-saving equipment.

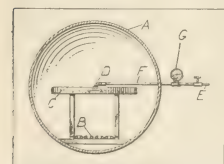
Air hoists are not new, but the application of this efficient and economical power to various uses in rubber mills is of comparatively recent date. The hoist illustrated here is specially designed for removing covers and lifting tire molds in and out of the heaters. Solid tire and hose molds are handled quickly and safely with this device and in removing calender and mill rolls its adaptability is instantly apparent to all practical men. The hoist is shown suspended from a trolley and travels on a track constructed from I beams that are hung from the ceiling over the machines the hoist is intended to serve. Air is supplied from the main line and the operator controls the movement of the piston by a conveniently placed handle that operates the valve lever. [Utility Manufacturing Co., Cudahy, Wisconsin.]



MACHINERY PATENTS.

VULCANIZING TUBING OR HOSE IN FIVE HUNDRED FEET LENGTHS.

IN the manufacture of rubber tubing or jacketed hose the usual procedure consists in first forming the interior of rubber stock which is then semi-cured and the jacket braided or woven about the tube. The hose is then vulcanized by admitting steam to the interior without application of heat to the exterior which sometimes resulted in poor adhesion between the plies of fabric.



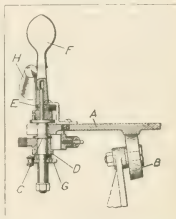
The method illustrated here apparently eliminates the disadvantages of the old process by subjecting both the interior and exterior of the hose to the same vulcanizing heat. In the drawing, which is a vertical section, *A* is the vulcanizer shell that is heated by steam pipes *B*. The pan *C*, supports the coils of hose *D*, the ends of which are connected to pipes *E* and *F*, through which the vulcanizing medium is introduced to the interior of the hose. This fluid medium is controlled by two valves and a gage *G* which registers the pressure within the hose. Dry air is admitted to the vulcanizer which is maintained at the required temperature by the steam coils. Thus the tubing or hose is cured in an even

manner, the interior and the exterior portions being subjected to the same vulcanizing temperature. [H. S. Blanchard, New York City, and F. Duesler, Cleveland, Ohio, assignors to the Mechanical Rubber Co., Cleveland, Ohio. United States patent No. 1,190,261.]

ROLLING BEADS ON NECKS OF TOY BALLOONS.

This machine is designed for forming beads on the ends of the tubular necks of toy balloons, with rapidity and without injury to the rubber stock. It consists of an annular plate or disk that revolves in a horizontal plane, supporting on its outer edge a plurality of forms over which the necks of the balloon are placed.

The drawing is a vertical section showing only one of these form carriers, the method of attaching to the revolving plate and the cone-shaped roller that forms the bead. The plate *A*, positively rotated by worm gearing, is supported by rollers *B*. The spools *C* are supported by a series of swinging arms *D*, pivoted to the under side of the plate *A*. The forms *E* support the balloons *F* and are rotated at the proper time by sprocket wheels *G* when brought in contact with the cone-shaped roller *H* that rolls up the bead on the neck of the balloons as they pass by. Means are provided for properly seating and holding down the forms on the carriers during the action of the bead roller which exerts an upward pressure on the balloon neck. [W. A. Brubaker and F. E. Brucker, Akron, Ohio. United States patent No. 1,192,383.]



GAMMETER'S VERTICAL PRESS VULCANIZER.

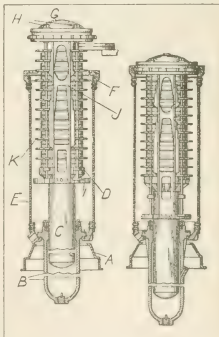
Hydraulic press vulcanizers of this type usually comprise a shell in which the tire molds are placed, a removable head with some sort of quick opening and tight closing device and a hydraulic ram or rams for raising or lowering the molds, and clamping them against the head.

Gammeter employs a single ram that simultaneously raises and lowers the molds and the head, against which the former are clamped by action of the ram while a specially designed packing ring effectively seals the joint between the shell and head.

The drawing on the left is a partly vertical section and side elevation of the press in position for charging and discharging. On the right is a similar view showing the head locked in position and the molds

being forced against the head by the ram during vulcanization.

The base *A* supports the hydraulic cylinder *B* in which reciprocates the ram *C* provided at its upper end with a platen *D*. The vulcanizing casing *E* is supported by a base ring that is attached to the upper flange of the ram cylinder, and *F* is a ring secured to the top of the casing, provided with alternating lugs and spaces, corresponding to those of the head *G*. Depending



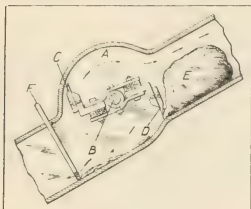
from the head is a mold frame consisting of four bolts *H*, the upper ends of which are fixed to the head and the lower ends to a ring *I* that slides freely on the ram piston. A pair of racks *J* are arranged one between each pair of rods, the upper ends being bolted to the head and the lower to the ring. These have shoulders that engage the mold carrying trays *K* that are each provided with holes through which the bolts pass.

When the molds have been placed on the trays the ram is lowered and the head rotated by a segment rack and pinion which locks it in place, and at the same time disengaging the frame from the ram head which is then free. Pressure is admitted to the cylinder and the ram forces the nest of molds upwards against the head. A rubber packing ring mounted in the ring at the top of the shell automatically seals the joint when steam is admitted to the vulcanizer. [J. R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City. United States patent No. 1,191,296.]

GUM CHICLE CUTTING MACHINE.

When in the raw state gum chicle is in the form of irregularly shaped blocks which must be cut into small pieces prior to the washing process. Usually this work is done by hand,

with the ordinary hatchet as the only tool, and is therefore a laborious and expensive process. On account of the low melting point of the gum a machine of special construction has been designed and is here shown in side elevation in the plane of a line through the center of the machine.



A is the housing in which revolves the shaft *B* carrying the revolving cutter head to which are bolted the knives *C* and *D*. The block or blocks of chicle *E* are fed by gravity to the knives which chop off a piece of gum at each revolution. The size of the chips and the quantity produced depends on the speed at which the knives are rotated and the weight of the blocks. The contour of the central part of the housing and the revolving cutter head produces a blast of air that is effective in cooling the gum and preventing it from melting and clogging the machine. [B. W. Brown, Roselle Park, New Jersey. United States patent No. 1,190,372.]

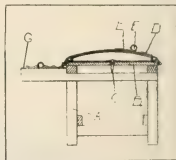
GOLF BALL.

The principal idea disclosed in this invention is embodied in the construction of a golf ball with a liquid center in which a ball having a greater specific gravity than the liquid, is free to move about, with the object of aiding flight and insuring better control of the ball.

The golf ball comprises a container *A* made of double texture fabric and filled with liquid *B*. Rubber tape *C* is wound under high tension around the container *A*, and rubber threads are then wound around the tape windings as indicated at *D*. Finally, then, the cover *E* is applied, which may be of any wear resisting material such as gutta percha. The ball *F*, as previously stated, is of a specific gravity greater than the liquid, and is made of hard composition or hardened steel with a smooth surface to prevent puncturing the container. While there is only one inner ball shown, more than one can be used if desired. [W. R. Knight, Bellville, New Jersey, assignor to St. Mungo Manufacturing Co. of America, Newark, New Jersey. United States patent No. 1,192,831.]

INNER TUBE ROLLING TABLE.

This radical departure from the old time flat top rolling table presents several points of novel interest, particularly the pneumatic feature. The drawing is a cross section of the new table.



The strip of stock *E* is laid on the table and the edges of the strip are moistened with rubber solution. The two operators place the mandrel *F* on the lower edge of the stock to which it adheres, and roll it up around the mandrel forming a tube. The mandrel and tube thereon is then rolled over the crown of the table and down to the rack *G* ready to be cured. [C. L. Witsaman, assignor to Firestone Tire & Rubber Co., Akron, Ohio. United States patent No. 1,194,803.]

SUBERS CORD COVERING MACHINE. A tubular flattened fabric band is made by inter-winding the individual strands previously impregnated with rubber on a mandrel at the same time that bands of unvulcanized rubber are interposed between the series. The fabric band is finally removed from the mandrel and flattened to form a band with selvage edges. [L. A. Subers, East Cleveland, Ohio. United States patent No. 1,192,017.]

CUSHION TIRE. Two rigid annular rings of sheet metal are placed on the inside of the rubber casing, one conforming to the inner circumference adjacent to the rim and the other to that of the tread. [T. L. Carbone, Charlottenburg, Germany. United States patent No. 1,192,036.]

TIRE BUILDING MACHINE. Four or more collapsible cores are carried by a revolvable frame that presents each core to different reels of frictioned fabric, so that while the inner fabric plies are laid on one core, the outer plies are laid on another, thus a plurality of casings are progressively constructed. [John T. Lister, Cleveland, Ohio. United States patent No. 1,190,432.]

A later patent relating to the same machine provides improvements in supporting and driving the cores and compressing rollers, also means for shaping the material to each core. [John T. Lister, Cleveland, Ohio. United States patent No. 1,190,433.]

MOLD AND PROCESS FOR SEMI-SOLID TIRES. The mold comprises separate annular side, top and bottom sections that are arranged to be clamped together. The annular body of rubber forming the tire is laid around the inner base that is built up of frictioned fabric forming an inner tube provided with an ordinary air valve. The tube is inflated, forcing the rubber against the walls of the mold, and the tire is then vulcanized. [M. A. Dees, assignor to American Tire Co.—both of St. Louis, Missouri. United States Patent No. 1,192,994.]

TIRE CASING INSPECTING MACHINE. The finished casing is passed between rollers so shaped that the tread is bulged inward, whereby the tire material is stretched and any imperfections disclosed. [H. J. Hoyt, assignor to Morgan & Wright—both of Detroit, Michigan. United States patent No. 1,193,691.]

THE UNITED KINGDOM.

CORD FABRIC SPREADER. The weftless fabric consisting of parallel cords, is fed between liquid solution rollers and then under a spreading knife whence it passes through a dryer and is then spooled with a liner between the rubberized fabric. [E. Burdin, 71 Rue Ney, Lyons, France. British patent No. 2,568 (1915).]

VULCANIZING TIRE CASINGS. The inner circumferential edges of a finished casing are brought together and held by a strip of unvulcanized tape forming a tube. This is placed in a two-part mold provided with an inner expanding ring that holds the tire in place. Steam is admitted to the interior of the casing which is then cured in a press vulcanizer of the Doughty type. [F. A. Byrne, 2 Ludgate Hill, Birmingham, England. British patent No. 8075 (1915).]

MAKING TENNIS BALLS. Inflated playing balls are made by first forming with beveled edges, hemispherical shells of semi-cured stock. The edges are cemented and the parts placed in two-part molds that are brought together in an atmosphere of compressed air, a portion of which is entrapped within the ball. The pressure of the surrounding atmosphere on the exterior of the balls being relieved, heat is applied to the molds and the balls are vulcanized. [R. H. Rosenfeld, Cleveland, Ohio, and F. T. Roberts, Trenton, New Jersey. British patent No. 8,756 (1915).]

COMPOSITE RUBBER SOLE. This invention consists of a sole with a tread portion of rubber or rubber composition and a shank or rear portion of a different material having greater strength and toughness than the rubber portion and also being less expensive. [Williams-Kneeland Co., South Braintree, Massachusetts. British patent No. 12,818 (1915).]

A COMBINATION SOLID AND PNEUMATIC TIRE. Two pneumatic tubes are embedded in annular openings that are molded within a solid tire near the central circumference, allowing sufficient rubber between the tubes and the tread. The tubes are inserted through narrow openings in the side of the tire and provided with suitable air valves, while the entire tire is enclosed in an outer cover. [R. Blakoe, 69 A. Queens Road, Bayswater, London, England. British patent No. 16,579 (1915).]

OTHER MACHINERY PATENTS.

THE UNITED STATES.

- 1,191,523. Tool for removing tires. T. H. McPherson, Le Roy, N. Y.
- 1,191,590. Cementing machine. J. P. Hall and A. Bates, Leicester, Eng. Assignor to United Shoe Machinery Co., Paterson, N. J.
- 1,192,143. Machine for coating fabrics. J. F. White and L. B. Ross, Chicago, Ill.; said Ross assignor to said White.
- 1,192,181. Bead rolling device for pneumatic tires. J. R. Gammett, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.
- 1,192,272. Pneumatic tire core. H. C. Brown and G. Williams, Akron, Ohio, assignors of one-third to E. McSweeney.
- 1,192,379. Cementing machine. F. A. Bracker, assignor to himself and F. L. Emerson, both of Bridgeport, Conn.
- 1,192,380. Cementing machine. F. A. Bracker, assignor to himself and F. L. Emerson, both of Bridgeport, Conn.
- 1,192,674. Drive-chain. F. J. Oakes, Indianapolis, Ind., assignor to Link-Belt Co., Chicago, Ill.
- 1,192,874. Separable core. W. R. Denman, Akron, Ohio.
- 1,192,937. Tire repair tool. L. V. Rodd, Marietta, Ohio.
- 1,192,994. Art of and mold for making rubber tires. M. A. Dees, assignor to American Tire Co.—both of St. Louis, Mo.

THE UNITED KINGDOM.

- 413,999 (1915). Machine for producing inlaid patterns of rubber in the form of sheeting or film. E. T. Fenwick, 600 F. street, Washington.
- 414,000 (1915). Machine for producing inlaid patterns of rubber in the form of sheeting or film. E. T. Fenwick, 600 F. street, Washington.
- 414,001 (1915). Machine for producing inlaid patterns of rubber in the form of sheeting or film. E. T. Fenwick, 600 F. street, Washington.
- 414,002 (1915). Machine for producing inlaid patterns of rubber in the form of sheeting or film. E. T. Fenwick, 600 F. street, Washington.
- 414,003 (1915). Machine for producing inlaid patterns of rubber in the form of sheeting or film. E. T. Fenwick, 600 F. street, Washington.
- 414,004 (1915). Machine for producing inlaid patterns of rubber in the form of sheeting or film. E. T. Fenwick, 600 F. street, Washington.
- 414,005 (1915). Machine for producing inlaid patterns of rubber in the form of sheeting or film. E. T. Fenwick, 600 F. street, Washington.
- 414,006 (1915). Machine for producing inlaid patterns of rubber in the form of sheeting or film. E. T. Fenwick, 600 F. street, Washington.
- 414,007 (1915). Machine for producing inlaid patterns of rubber in the form of sheeting or film. E. T. Fenwick, 600 F. street, Washington.
- 414,008 (1915). Machine for producing inlaid patterns of rubber in the form of sheeting or film. E. T. Fenwick, 600 F. street, Washington.

CANADA.

- 168,555. Tire molding machine. Gutta Percha & Rubber Limited, assignee of J. H. Coffey and J. H. Coffey, Jr.—all of Toronto, Ontario, Canada.
- 168,861. Fabric winding apparatus. Miller Rubber Co., assignee of F. F. Brucker—both of Akron, Ohio.
- 168,994. Rubber sheeting machine. United Shoe Machinery Co., of Canada, Limited, Manchester, Ontario, Canada, assignor of E. E. Winkley, Le Roy, Mass.

THE FRENCH REPUBLIC.

- 479,698 (September 1, 1915). Improvements in vulcanizers. The Goodyear Tire & Rubber Co.
- 479,736 (September 14, 1915). Improvements in apparatus for securing elastic masses. Rubber Regenerating Co.

PROCESS PATENTS.

PROCESS OF MAKING HOSE. The inner tube or lining is made on a tubing machine and semi-cured, after which a fabric cover is woven on a circular loom and placed over the tube when in a collapsed condition. The tube is then inflated, and another cover put on by passing it through a tubing machine, and finally the hose is vulcanized in any suitable way. [A. T. Hopkins, Cleveland, Ohio, assignor to The Mechanical Rubber Co., Cleveland, Ohio. United States patent No. 1,190,292.]

PROCESS OF FORMING ARTICLES FROM PLASTIC MATERIALS. The materials are reduced to a powder and a light coating sifted upon the mold which is then heated to expel the gases and render the material plastic. Another thin coating is sifted upon the previous layer and the mold again heated. This operation is repeated until the required amount of material is in the mold, which is then closed and subjected to pressure, heat and finally cooled. [W. J. Burns, assignor to The Peerless Vulcanite Co.—both of Bridgeport, Connecticut. United States patent No. 1,190,510.]

MOLDING HOT WATER BOTTLES. The parts are semi-cured in a mold and then removed, stripped from the core and again assembled with a T-shaped binder strip of quick curing stock between the edges. The bottle is then placed in the mold, partly inflated and fully cured with heat and pressure, producing a seamless article. [N. D. Crawford, Elizabeth, New Jersey, assignor to The Mechanical Rubber Co., Cleveland, Ohio. United States patent No. 1,190,731.]

SOLID TIRES AND TREADS OF PNEUMATIC TIRES. These are made by laying unwoven fibers side by side, forming strips, one fiber thick, that are then impregnated and enveloped in rubber. These strips are superimposed, forming a block from which sections are stamped, built up and vulcanized in the form of a solid tire or shoe, with the ends of the fibers presented to the wearing surfaces. [J. W. H. Dew, London, England. United States patent No. 1,191,876.]

MAKING ELASTIC LEATHER. Soft leather is stretched, coated with rubber cement and united to a piece of elastic fabric under tension. After the cement has dried, the tension is released and the elastic fabric is stripped from the leather, leaving the dried film of rubber on the leather. This is again stretched, coated with cement and united to the elastic fabric a second time. After drying, the tension is released and the leather and double film are again stripped from the elastic fabric. These operations are repeated until the leather has sufficient elastic material in and on it for the intended purpose. [M. Scheuer, assignor to Carrie Scheuer—both of New York City. United States patent No. 1,192,691.]

PROCESS OF TREATING TEXTILE MATERIALS. The fibers are carded or combed into substantially parallel lines and subjected to a vacuum to expel the gases, at the same time the material is impregnated with rubber solution. In the manufacture of tires, hose and other products from this material the fibers may be laid radially, diagonally or in a combination of ways. [R. B. Price, New York City, assignor to Rubber Regenerating Co., Ishpuka, Indiana. United States patent No. 1,192,794.]

PROCESS PATENTS.

THE UNITED STATES.

- 1,193,883. Method of producing articles of a vulcanizable plastic. A. G. Emery, Brooklyn, N. Y., assignor to Rubber Regenerating Co., Mishawaka, Ind.
- 1,194,143. Making insulated wire. T. J. Sisson, assignor to The Cable Co.—both of Bridgeport, Conn.

CANADA.

- 168,554. Process of molding and vulcanizing rubber. The Gutta Percha & Rubber Limited, assignor of J. H. Coffey and J. H. Coffey, Jr.—all of Toronto, Ontario, Canada.

THE FRENCH REPUBLIC.

- 479,785 (September 9, 1915). Method for treating elastic substances. Rubber Regenerating Co.
- 479,806 (September 23, 1915). Process for manufacturing articles of vulcanized plastic materials. Rubber Regenerating Co.

The Editor's Book Table.

FUNDAMENTALS OF A COST SYSTEM FOR MANUFACTURERS.
A System of Accounts for Retail Merchants. By Robert E. Licht and R. W. Gardiner, Federal Trade Commission, Washington, D. C. [Paper, 8vo, 32 and 19 pages, respectively.]

TWO small but comprehensive pamphlets have been published under the direction of Edward M. Hurley, Chairman of the Federal Trade Commission, Washington, for distribution to manufacturers and merchants throughout the United States. These books not only show the importance of a thorough system of costs for manufacturers and a complete system of accounting for retail merchants, but give the various details for installing these systems, with a thoroughness and simplicity which should enable anyone to install such a system in his business, whether it be large or small. Every item which enters into costs is explained, and methods are shown for securing the facts, and arranging the forms for recording them. These books, we understand, are distributed free, and can be obtained by addressing the Federal Trade Commission at Washington, D. C.

ACCEPTANCES: CIRCULARS, REGULATIONS AND INFORMAL Rulings of the Federal Reserve Board, including Opinions of Counsel. National City Bank of New York. [Paper, 32 pages.]

This little book gives an explanation of the use of acceptances by banks in the way of business; explains the manner of their use; shows forms and specimens of bills drawn in foreign countries or locally; gives circulars and regulations of the Federal Reserve Board on acceptances, together with legal rulings and explanations. The book is a concise and valuable guide for those who have dealings with the banks, and may well find place in the offices of many business establishments.

PERSONAL REMINISCENCES OF JAMES MAPES DODGE. BY Charles Piez. [Paper, 24 pages, with portrait.]

Mr. Piez was for many years intimately connected with the late Mr. Dodge, and his tribute to the memory of the latter is a graceful one, showing not only Mr. Dodge's broad grasp of mechanical and business problems, but telling of the various vicissitudes of the development of the Link-Belt Co., of which he was the executive as well as the engineering head. The booklet is an interesting one, has a fine portrait of Mr. Dodge, and has also several other interesting illustrations showing in detail some of the problems which he solved. It will undoubtedly be read with interest by all who had the honor of his acquaintance.

TARIFF SYSTEMS OF SOUTH AMERICAN COUNTRIES. BY Frank R. Rutter, Department of Commerce, Washington, D. C. [8vo, 308 pages. Price, 25 cents.]

This book was prepared primarily for the use of exporters and gives full information regarding South American tariffs and customs methods, describing, under each country, the system in force. Those who know how intricate the tariffs, with the various surtaxes and the heavy fines imposed for non-compliance with details, will appreciate the exactness and thoroughness of detail of this report, written after personal investigation and years of study, by Dr. Rutter, who is assistant chief of the Bureau of Foreign and Domestic Commerce and was formerly chief of the Division of Foreign Tariffs of that bureau. This report also gives export duties, in which it is noted the export duties exacted on rubber, in Brazil, Bolivia and Peru.

PRACTICAL SAFETY METHODS AND DEVICES. BY GEORGE Alvin Cowee, D. Van Nostrand Co., New York City. [8vo, 434 pages. Price \$3.15.]

It is claimed that industrial accidents cost this country 35,000 human lives and more than \$500,000,000 annually, and in addition to this, other serious injuries and minor accidents bring the number well up to 2,500,000 each year. It is to arouse interest in the prevention of such accidents and to explain how this can

be brought about, that this book is published. It gives descriptions of tried and proven methods and devices, rules for manufacturing establishments, and the general principles for securing a larger degree of safety for all classes of industrial workers. The book is divided into 37 chapters, and is illustrated by more than 125 pictures and diagrams of safety devices. It has chapters on welfare work and on first aid to the injured; a brief classification of occupational diseases; rules for fire drills and special chapters devoted to accidents from fires, boilers, engines, elevators, electric transmission, tools and various lines of machinery, and in construction work. In the preface it is stated that no attempt has been made to cover the subject in all its branches and that an exhaustive treatment is altogether impossible within the limits of a single book, but that the general principles suggested will be useful in special and exceptional applications not specifically described in its pages.

THE SEVENTEENTH YEAR BOOK AND ANNUAL REPORT OF The Rubber Club of America, Inc., Prepared by the Secretary.

The year book of The Rubber Club of America, Inc., just issued, is an ambitious publication of nearly 100 pages, containing a large amount of information regarding the club, its membership, its constitution, and its various committees, with the report of President George B. Hodgman and that of Secretary Harry S. Vorhis. The reports of the directors' and committee meetings give details as to the doings of those bodies. The report of the sixteenth annual banquet gives the speeches in full and, last but not least important, are the membership lists of firm, associate and honorary members. On the last two pages are given the names of members who died during the past year. Fine half-tone double page pictures are shown of the sixteenth annual outing at Lowell, Massachusetts, and the sixteenth annual banquet at the Waldorf-Astoria, New York City.

NEW TRADE PUBLICATIONS.

THE Link-Belt Co., Chicago, Illinois, is sending out No. 275, giving the revised price list, effective July 15, of the many different lines of goods manufactured by this company. The pamphlet is essentially a business one, full of facts and figures, and is intended to supersede all previous catalogs and price lists of the company.

The Racine Rubber Co., Racine, Wisconsin, is sending out a very attractive little booklet entitled "The How and Why of Racine Tires," giving descriptions and pictures of the various processes in the making of these tires, from the securing of the rubber to the wrapping and shipping of the finished product. The various styles of treads are shown and figures for the tire user are given, showing the proper pressure of inflation in the different sectional sizes; the table of weights to be used with tires of different dimensions; some directions for repairing; adjustment of brakes and other instructions which are likely to insure good service from these tires. The center of the book contains a bird's-eye view of the factory printed in two colors, and are several of the other illustrations in the book.

The B. F. Goodrich Co., Akron, Ohio, is distributing a "Goodrich News Service" which is in the nature of posters or cards for use in the windows of the various agencies of this company. Two recent ones are, respectively, an outline map of the United States, over which are shown a large number of automobiles and motor trucks, and the other, a picture of a prairie schooner

as compared with an automobile with similar furnishings, one showing the first trip, and another the present trip, of a pioneer over the old Oregon trail. The pictures are interesting, and are likely to attract the attention of automobile users and others to the goods of this company.

The Hardware & Supply Co., Akron, Ohio, sends out a very neat cloth-bound book giving a list, with prices, of the many tools which it makes for rubber workers. The book is well illustrated, showing in detail the many styles of tools made and in some cases explaining their use. There are several blank pages arranged for such additions as may be sent from the firm, or memoranda to be made by the holder of the catalog.

IMPROVEMENTS IN DEEP SEA DIVING.

In the July number, Spanish edition, of the Bulletin of the Pan American Union is an interesting article on deep sea diving. It states that companies are being organized to recover sunken ships and the valuable treasures which have gone down with them, by means of great improvements in deep sea diving resulting from experiments conducted under the auspices of the United States Navy. This article states that not until the elasticity and imperviousness to water of vulcanized rubber became known did the modern diving apparatus become possible. This apparatus is fully described, and is similar in details to what has already appeared in *THE INDIA RUBBER WORLD* (January, 1915, page 189). It is now stated that as a diver can descend to depths of 250 to 300 feet, it seems feasible to salvage ships and treasures that

have lain at the bottom of the sea for many years. Examples are given of many such which are within that distance of the surface, also a list of cargoes of gold, silver, bullion, securities and jewelry, all of which it might be possible to recover because of the improvements in diving apparatus which are due to the experiments under the direction of the United States Navy.

COMBINED TIRE RACK AND WINDOW CARD.

Tire manufacturers appreciate the value of window advertising and many novel cut-outs and cards are made for such display. The Pennsylvania Rubber Co., Jeannette, Pennsylvania, is sending to its agencies

racks of heavy, warp-proof, 15-ply cardboard. Each rack contains a slot in which a tire can be inserted in such manner that each supports the other, thus eliminating brackets or easels. These racks are handsomely printed, each calling attention to the special type of tire exhibited, and, altogether, form a most attractive way of showing the tires to advantage.



Interesting Letters from Our Readers.

BUYING RUBBER DIRECT IN THE EAST.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR SIR: The article in your July number entitled "A Pretext From London," on the relative merits of shipping rubber direct from the East to America, and shipping via London, has been read with interest, and it certainly would be against the traditional English policy for the government to adopt any such policy as the "Financier" apparently desires them to adopt. The chief argument, however, which should influence the British public against the plan of shipping all the rubber via London is that this will diminish the profits of the British investor. A few of the investors indeed may profit by it, namely the London agents to whom the rubber would be consigned. These people are usually large shareholders, and in addition to their dividends they would get commissions. But what about all the other shareholders? Rubber will not become more valuable by having passed through the port of London. The value of one pound of rubber to an American manufacturer will be exactly the same, and all the extra cost of freight, handling, London commissions, etc., will have to be debited, directly or indirectly, to the producing company, and from all the conversations which I have had with planters in the East I am convinced that they are thoroughly alive to this fact. A country does not grow wealthy through opposing the ordinary economic laws.

It is also particularly interesting to note that it is the "Financier" which is saying that rubber should come by way of London, and that your contemporary, "The India Rubber Journal" of London, which is the principal trade paper there, takes quite the opposite view in its issue of July 15 under the heading of "Eastern Rubber Sales." The whole of this article is well worth reading, and the suggestion which they make is a good one, that the London firms who wish to continue handling this rubber should open branches in the Eastern ports. This would

be a good plan. They would earn the same commissions which they are earning now, and yet they would do useful work for their living, instead of simply duplicating other people's work in a useless manner.

Yours truly,

A BUYER IN EASTERN MARKETS.

FROM A WELL KNOWN EDITOR AND ESSAYIST.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR SIR: Your leading editorial in the August issue, entitled "Preparedness—Looking Backward," and taking the unique form of an imaginative letter, will set many men, old as well as young in the trade, to thinking. There is ever a tendency to become so thoroughly engrossed with one's own problems of the day as to fail to give due thought to the morrow or to see things from other than one's own, often narrow viewpoint, and there is no better way for the prophetic thinker to enlighten those who look to him for inspiration than to picture as lucidly as may be a possible outcome of present conditions, their consequences and avoidance in years to come. In doing this so logically, you have sounded a much needed warning at a time when an object lesson is being enacted across the seas which emphasizes its significance most emphatically.

We have heard much recently about industrial preparedness in the abstract. For the most part it has been mere exhortation without concrete particulars, but you seem to have brought the entire rubber industry into true perspective in its relation to military expediency, to have appreciated its weaknesses and to have pointed out likely means of remedy. Rubber has come to occupy so important a place in the processes of war, as well as of peace, that there is great need of constructive suggestions such as yours emanating from an authority untrammelled by entangling alliances of the trade, and possessed of a broader

vision than that of many who are so closely confined to their own particular departments of it as to have lost their sense of proportion. You have penned a vivid picture of what might reasonably be expected to ensue should this country under present conditions find itself besieged as Germany now is. The facts are not overstated; every word rings true, while the graphic manner of portrayal you adopted, more certainly than commonplace direct statement, will attract the attention and stimulate the thought of those conservative men whose first line of defense in the face of proposed innovations invariably is that they "must be shown."

German industrial preparedness holds much to inspire admiration and to teach us many wholesome lessons, particularly in the field of chemistry. Not always have the fundamental ideas been of native origin; England and America have provided untold inspiration. Indeed, German scientists in many lines have borrowed generously from all available sources, but by the application of that phlegmatic perseverance and painstaking thoroughness characteristic of the race, they have almost without exception developed a state of higher efficiency. The light of scientific research has been turned upon even the commonplace of life, and under pressure of war necessity the resourcefulness with which almost every by-product has been utilized and the ingenuity with which many available, and in certain instances previously neglected, materials have been made to serve new purposes, is little short of marvelous.

Germany has developed her natural resources and economic opportunities to the very limit, and by intelligent conservation and clever scientific use has done the utmost with all imported commodities, yet she now finds herself greatly in need of a few vital things, notably such metals as copper and nickel and also crude rubber. This serious shortage of raw materials indicates indisputably the importance to every nation of becoming, or paying the way to become, virtually independent in anticipation of a state of war covering a period of years. For many small nations and because of geographical and attendant conditions this is physically impossible, but their hazard is correspondingly less. The United States, however, the richest and most envied in the family of nations, may well take heed lest at some future time jealous members of that family attempt to crush her. While it would be difficult and probably impossible for an enemy to maintain an effectual blockade of our entire seacoast, our imports could be seriously interrupted and a large percentage of cargoes seized or destroyed.

Preparedness constitutes the best insurance against war, and that infers industrial, quite as much as military, preparedness, for it is through the former that the latter is possible. We must place ourselves in a position to be independent of imports if necessary. We must look to our raw materials and develop a source and supply of each and every one of them within our borders, at least sufficient to meet military needs. With raw materials in ample quantity, the various processes of refinement and manufacture will practically take care of themselves. Our chemists, electricians, and machinists are as intelligent and ingenious as any in the world. Their weakness has been a natural reluctance to enter certain fields which had become highly developed abroad. Not until the outbreak of the present war in Europe did we realize fully our dependence upon Germany in several branches of chemistry, notably the many ramifications of the coal-tar industry. But in this particular instance we have the raw material, our chemists are grappling with the intricate niceties which had become so highly specialized along the Rhine, substantial progress is being made, and while it will take time, the day will come when we shall be able to manufacture any and all coal-tar derivatives if necessary.

Our country is so vast in extent, so varied in soil and climate, so rich in natural resources, especially minerals and metals, that preparedness is not so much a problem as a matter of application, a matter of setting to work with the knowledge we have

and accomplishing the desired end. A bountiful Providence has blessed us with most of the essentials of peaceful life and of defense. Most of the few we lack, among which crude rubber stands first, are of an agricultural character and, thanks to the variety of our soil and climate, may be grown at home. Steps ought to be taken to supply these materials at once; it is our patriotic duty, and in times of peace as in times of war untold fortunes await the successful pioneers. Intensive methods should be resorted to if necessary. They have been applied to the production of table delicacies that we may have fruits and vegetables out of season and in unfavorable latitudes, also that staple crops may be grown on arid lands, so why not deal similarly with these great problems of exigency?

When you suggest the possibilities of the *Picramnia*, the *Elaeagnus* root and rubber producers of the guayule and grass rubber sort, you point out the foundation of a great American industry of the future. Here is constructive work of superlative importance for our botanists and rubber experts, offering a financial reward in proportion to the task. In the manufacturing end of the rubber industry America takes first place, and what we need to make it secure should war ever become inevitable, is an increasingly productive source of crude rubber grown at home. The project is feasible, laudable and should and would receive the hearty support of the trade.

Let me suggest that marked copies of this editorial be sent to the leading agricultural periodicals in the hope that the editors will reprint it and thereby give their more enterprising readers a valuable suggestion for investigation and experiment. Both the feasibility and the opportunity to grow rubber producing plants in the United States deserves the widest publicity.

Very truly yours,

PHIL M. RILEY

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless, they are of interest, not only in showing the need of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

[204.] A correspondent has inquired for the address of manufacturers of the "Jolly Spiral Balance" and "Nicholson Hydrometer."

[205.] Inquiry has been received for builders of machines for turning and crimping the edge of rubber bathing caps.

[206.] The name of a manufacturer of machinery for making balata packing is requested.

[207.] We have been asked for information concerning the makers of a motor-driven mold cleaning device.

[208.] The name of a manufacturer of carbon bisulphide is requested.

[209.] Information is sought regarding the process of making a rubber cement which will retain its elasticity after application.

[210.] We are requested to supply the names of manufacturers of inner tube mandrels.

[211.] A correspondent desires names of manufacturers of a Black Kraft or black pattern wrapping paper suitable for use as wrapping for automobile tires.

[212.] Inquiry has been received for names of manufacturers of machinery for making rubber tiling.

[213.] We are asked who can supply tools for tapping *Castilleja* rubber trees.

[214.] Names of manufacturers of transparent nipples are requested.

[215.] An exporter of automobile tires and automobile outfits has requested names of manufacturers of these articles.

[216.] Names and addresses of rubber tire machinery manufacturers have been requested.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS

A firm in France wishes to be placed in communication with American manufacturers of washing machines and wringers with rubber rollers. Report No. 21,933.

Agencies are desired for Chile and Argentina from American manufacturers of rubber goods. Report No. 21,941.

Commercial relations are desired in Denmark with American manufacturers of rubber tires. Report No. 21,953.

A physical culture instructor in Brazil wishes to receive catalogs, price lists, etc., of footballs and other athletic and sporting goods. Report No. 22,090.

A manufacturer in Spain is desirous of importing tires for bicycles. Report No. 22,092.

A newspaper in the Far East with stationery and job printing departments desires to obtain connections in the United States with dealers in rubber stamps. Report No. 22,131.

A dealer in France desires to purchase gold nibs and barrels with necessary parts for the manufacture of fountain pens. Report No. 22,139.

A firm in Spain is in the market for rubber erasers. Report No. 22,150.

A firm in the United States wishes to secure for transmittal to correspondents in Japan, quotations and literature covering cotton and silk elastic for garters and braces. Report No. 22,158.

Additional agencies are sought in Argentina for the sale of rubber heels and soles and other American products. Report No. 22,173.

A firm in the Netherlands desires to get in touch with American manufacturers and exporters of rubber nipples and tubes for nursing bottles. Report No. 22,190.

A Norwegian import firm wishes to communicate with American manufacturers of automobile tires and accessories. Report No. 22,195.

JUDICIAL DECISIONS.

BUFFALO SPECIALTY CO. v. VAN CLEEVE. In an action for the wrongful use of the plaintiff's trade-mark name "Never-leak," in connection with the manufacture and sale of "tire fluids," it appeared that the plaintiff manufactured the tire fluid according to a secret formula. Another party obtained a patent for a vehicle tire, which consisted of a combination of a pneumatic tire and a free-flowing sealing agent within the air chamber. The plaintiff purchased this patent, and thereafter used, in connection with its tire fluid, a label on which appeared a circle presenting a pneumatic tire within which were the words: "Patented U. S. A. Foundation patent No. 578,551." Below the circle were statements that this was the foundation patent, and covered the use of any liquid, semi-liquid, paste, powder, or compound, capable of being converted into or used in connection with any liquid in any pneumatic tire for closing punctures; that the plaintiff's tire fluid was manufactured and sold under and by the owner of such patent, and that persons making, selling, or using any other such fluid were infringers. The Circuit Court of Appeals held that the plaintiff was justified in buying the patent to avoid infringing it, and the label in question was not such an abuse of its patent rights as deprived it of its pre-existing property right in its trade-name. If, as the court assumed, the patented tire had no generic name, and all pneumatic tires, whether containing a free flowing sealing agent or not, were made and sold under the marks and names of their manufacturers, the expiration of the patent could not authorize the public to use the trade-name of the unpatented element, under the rule that the expiration of the patent authorizes the use of the name of the patented article, where it has become a generic name.

All that could be said from the face of the label was that the

plaintiff needlessly gave true information of the fact that prior to March 9, 1914, the patent was in force, and inferentially that it had been owned by the plaintiff and used in some way not disclosed by the label. This, it was held, did not deprive the plaintiff of its right to equitable relief against piracy of its trade-name and unfair competition. [The Federal Reporter, Vol. 227—page 391.]

PERLMAN v. STANDARD WELDING CO. The Perlman patent No. 1,052,270, for a wheel for automobiles, the special feature of which is a demountable rim. Held not anticipated, valid, and infringing. [The Federal Reporter, Vol. 231—page 734.]

This case was reported at length in the May 1916 issue of THE INDIA RUBBER WORLD.

MACDONNELL v. VORLIES RUBBER MANUFACTURING CO. The Federal District Court D. New Jersey, holds that the MacDonnell patent, No. 981,208, for an improvement in pneumatic tires, which consists in rendering the inner tube self-healing in case of puncture, by means of a wrapping or stay strip of canvas, which is incapable of stretching transversely, but capable of stretching in a direction longitudinally of the tire, was not anticipated, and discloses invention; and also that it was infringed by the tubes made in accordance with Brown's application for patent, serial No. 704,637. [The Federal Reporter, Vol. 227—page 898.]

SPALDING v. GAMAGE. The case in which A. G. Spalding & Bros., the well-known American sporting goods concern, claimed damages against A. W. Gamage, Limited, the large London sporting goods firm, in respect to passing off condemned footballs which had been sold by the plaintiffs as waste rubber, as "Spalding's Improved Sewn Orb Balls," which was reported in the May 1915 issue of THE INDIA RUBBER WORLD, came recently before one of the official referees of the High Courts of Justice, in London, for assessment of damages.

After hearing evidence which lasted many days, the official referee made his report to the judge, who found on the whole of the evidence that the plaintiffs were injured by the acts of the defendants, and that they were entitled to recover the sum of £2,000 [\$9,733] for injury to their reputation.

LOVELL-McCONNELL MANUFACTURING CO. v. ORIENTAL RUBBER SUPPLY CO. This suit was brought under the patent laws of the United States for infringement of the United States letters patent No. 1,120,057, for a diaphragm horn for automobiles.

The United States Circuit Court of Appeals, Second Circuit, held that the taking of two steps in changing a prior device, both obvious and not involving invention, and unpatentable when taken separately, does not involve invention and become patentable when taken in unison. A combination of old elements, to be patentable, must produce a new result or effect in the combined forces or processes from that given by their separate parts.

Patent No. 1,120,057 was therefore void for lack of invention, in view of the prior art.

Though a rubber company was involved in this case, the disputed patent contained no rubber. [The Federal Reporter, Vol. 231—page 391.]

MICHELIN TIRE CO. v. ROBBINS AND OTHERS. This case was an appeal by the defendant party from a judgment for plaintiff. Judgment as against the defendant was reversed, and complaint dismissed as to him, the court of appeal holding that where a tire company knew that a garage business was transferred to new proprietors, and accepted them as the persons with whom it would fulfill its contract, intending to release the old proprietor from further performance of the contract, and accept the new in his place as parties, there was a "novation." [New York Supplement, Vol. 159—page 256.]

Use of the name of the manufacturer in a tire advertisement for an old tire, when the tire is not the property of the manufacturer, is not a violation of the trademark law.

New Goods and Specialties.

THE NEW NAUGAHYDE RAZOR STROP.

NOVELTIES in rubber designed to supplement, if not replace leather, are constantly developing these days when the price of leather is high and still advancing.

The difficulty of making a complete replacement of leather is a handicap seldom overcome, but in the case of the Naugahyde Razor Strop, developed during the past year, this problem seems to have been successfully met.

It has been developed and tested by the latest scientific methods, with most excellent results.

Its composition is such it will put a keen edge on the finest quality of razor with very limited stropping, only a few strokes being necessary to obtain the desired edge.

The abrasive material in the strop is so combined that it sharpens the razor quickly, and at the same time prevents the edge from wearing down and becoming round. It is seldom necessary to hone a razor sharpened on this strop.

The strops are made in two styles and sizes, with either nickel or gun metal swivels. They may be had in double strops with the sharpening and finish sides separated, or in single strops with the two sides combined. [Goodyear's Metallic Rubber Shoe Co., Naugatuck, Connecticut.]

RINGMETER GARDEN HOSE.

The continuous-length hose shown in the accompanying illustration is self-measuring, owing to the flat rings of rubber which are placed upon it exactly one foot apart. This is a great convenience, as it is only necessary to count one foot for every ring as the hose is unwound. This hose is of the molded type and consists of a seamless tube covered with plies of braided



fabric and a durable, corrugated cover. It is made in three sizes— $\frac{1}{2}$ -inch, $\frac{3}{4}$ -inch and $\frac{1}{2}$ -inch. [Quaker City Rubber Co., Philadelphia, Pennsylvania.]

VULCULOSE SANITARY RUBBER TOILET SEAT.

The advantages of a one-piece toilet seat over the old style wooden seat are self-evident. Disease germs can find no lodging place; there are no seams or joints to open up, and it will not warp, crack nor split.

The varnish on wooden seats is soon eaten off by acids used for cleaning, as well as by uric acid, but this rubber seat has an ebony black finish, polished surface which will not wear off nor sustain injury through the use of sulphuric acid, carbolic acid or any cleanser or disinfectant. The fittings are nickel-plate throughout, and claimed to be unbreakable under any ordinary use. The three soft rubber bumpers are of peculiar design and are placed at



three bearing points. They are vulcanized into the hard rubber seat, and therefore cannot become loose. [The Vulculose Co., Chicago, Illinois.]

"UNIKA" FINGER COT.

These rubber finger cots are designed as convenient and useful aids in the work of mail and office clerks, cashiers and bank



tellers, their non-slipping qualities being of decided advantage in sorting mail, counting money and in general office work. They are also in demand by fruit packers. They are intended to be worn on the thumb, as well as on the forefinger, and are supplied in assorted sizes. A feature of value is the arrangement of round openings for ventilation, making long continued wear of these protective coverings possible with a greater degree of comfort than unventilated ones. [United States Rubber Co., New York City.]

CHIN MASK AND TOWN BAND.

The purpose of rubber chin masks is well known: When worn during the hours of sleep, they hold the relaxed muscles in place and prevent the sagging which forms the unsightly



double chin. A special advantage of the mask here illustrated lies in the fact that it extends further up on the face than is customary, covering the upper lip and acting as a remover of the nose-to-mouth lines. It also extends down lower than some other chin masks, tending to whiten the skin of the throat and remove the discolorations caused by high collars.

This mask is fastened by means of tapes, which can be adjusted, if closer tension is desired, by slipping the hook and eye down

on the tapes, thus shortening the lower tapes.

A rubber frown band is also shown, the use of which prevents the frown and lines in the forehead. [Miss Lillian Bender, Stockton, California.]

THE "NEW PARAMOUNT" TENNIS BALL.

The "Paramount" tennis ball, although successfully marketed for some time, has been the subject of continued expectation

to still further improve its resiliency. The results are claimed to be a greatly added resiliency, with no impairment of the many other sterling qualities of the ball. Tennis balls are ordinarily made in four sections and inflated with a hollow needle that penetrates a self-closing rubber plug inside the ball, but the "New Paramount," through its special patented construction, is made in two pieces, without a plug, thereby insuring a more perfect bounding article. [A. J. Reeb Co., Philadelphia, Pennsylvania.]



WATERPROOF FABRIC AND GARMENTS.

A new waterproof fabric has been perfected for the manufacture of women's coats, which is radically different from any previously placed upon the market. It is named "Silvareign,"

because of its shimmer of silver or gold, and is made in a number of beautiful tints. It combines the lightest weight of silk with rubber, and is made up in a number of attractive lines of garments having that style which commends them for sport and motor coats for fair weather wear, sunlight imparting to them a strikingly beautiful iridescence, while their water-resisting quality makes them ideal for rainy weather. The fabric was invented, its manufacturing problems solved and the lines of garment designed by the manufacturer, who has patented the material and trademarked the name, and who will enter upon a national advertising campaign early this fall. [E. Kenyon Co., Brooklyn, New York.]



BOWLING MAT AND FOOT-GRIP.

Bowling on the green is more general in England than here, although evidence that it once was popular in this country is shown by the name of an open square in the southern part of New York City called "Bowling Green." To protect the lawns from excessive wear during this game a rubber mat with a corrugated surface, such as is shown here-

with, is used for the players to stand upon. The standard size for this mat is 22 by 14 inches, but other sizes are furnished as desired.



The side view of a rubber overshoe also used for bowling and for curling shows the high back section and the toe cap which hold the rubber sole on the foot. The back section is overlaid with an extra thickness of tough rubber so molded as to grasp and hold firmly to the shoe. The sole is made perfectly flat, in order not to damage the surface of bowling greens, and it provides a non-slipping foothold on the keenest green or ice. This style of rubber overshoe would also prove convenient and useful in any other game played on lawns, or as a substitute for tennis shoes or "sneakers" in an indoor bowling alley. [The Waverley Rubber Co., Limited, Edinburgh, Scotland.]

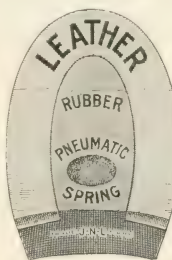
"IMPERIAL" RUBBER SHEETING.

There is an ever increasing demand for high quality rubber sheeting, and it is claimed that in the "Imperial" sheeting an article has been evolved, by laboratory experimentation covering two years, which combines all the essentials for a sheeting that will withstand without injury the most severe tests of sterilization, resistance to steam under pressure, dry heat, boiling water,

acid, alkali and saline solutions, chloroform, ether, lysol, urine, oxidation and gasoline. Moreover, the manufacturers of the "Imperial" line claim to have discovered a secret process which prevents maroon, black or tan colored sheeting from fading. [Rosenwald & Weil, Chicago, Illinois.]

JONES "NEVER-LOOSEN" RUBBER HEELS.

In the rubber heel here illustrated a specially prepared strip of leather is vulcanized to the outer edge of the rubber heel when made, forming a leather rand which can be nailed close to the edge on any shoe heel, even one with composition or fiber lifts.



There are no washers in this heel, the leather rand acting as a substitute, holding the nails as does the "lift" of a leather heel. This not only obviates the labor of cementing the edges of the rubber heel to the shoe but prevents the loosening and spreading to which cemented rubber heels are claimed to be liable. A chamber or air space gives a pneumatic cushion, adding to its resiliency. These heels are closely trimmed, fitted to any shape heel, and can be applied correctly by even the

most inexperienced workman. [Jones "Never-Loosen" Rubber Heel Co., New York City.]

HYDROMETER MADE OF RUBBER.

Testers of non-freezing solutions, used for cooling gasoline engines, are usually made of glass, and are easily broken. An unusually durable device for this purpose consists of a specially made rubber ball attached to a tag bearing the necessary directions for using it as a tester. To secure correct proportions, these balls are constructed in halves, each half being tested individually as to its specific gravity and then assembled with another half of such gravity that the two together have the same specific gravity as the correct anti-freeze solution for which the ball is to be used. Different balls are made for solutions of as many different sorts and they indicate, by floating or sinking, whether the solutions are too weak or too strong. This tester, or hydrometer, can be used to test the solution directly in the radiator by dropping the ball through the filling cap, or by drawing the mixture into a receptacle and dropping the ball in it. If it floats, more alcohol and glycerine should be added to the mixture, while if it sinks there is perfect safety. When heated, the rubber ball expands at practically the same rate as the solution being tested, making it unnecessary to correct for any temperature differences other than allowing the ball to remain in the solution about one minute before observing whether it floats or sinks. [The Liquid Tester Co., Lancaster, Ohio.]



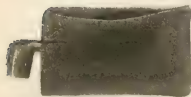
A SINGLE TEXTURE RAINCOAT FABRIC.

Scintella is a dress goods fabric that has recently claimed attention in the rubber clothing trade as an excellent material for single texture raincoats for women. It is made of imported artificial silk and worsted and, as its name indicates, it scintillates a silken, silvery glow over a surface of a darker tone or color. Being of light weight, yet having sufficient body, it

stands itself readily to straight effects or to the soft folds and fullness now popular in the newest styles. Supple and pliable, with enough resistance to prevent wrinkles, it makes a desirable material for week-end garments, as it packs snugly without creasing. It can be obtained in a variety of colors, though the black and white combination is most popular for single texture women's raincoats, auto coats, travel coats and golf capes. [E. Priestly & Co., New York City.]

THE "ALL-TOGETHER" POUCH

A new idea in rubber-lined tobacco pouches admits of carrying the pipe in the same receptacle. It is more convenient than using two cases and keeps the pipe cleaner than if carried loose in the pocket. Separate compartments contain the tobacco and pipe and the whole is claimed to be no less compact and easy to handle than the ordinary tobacco pouch. The "All-Together Pouch" is made of doekskin and lined with high grade rubber of English manufacture. [M. M. Importing Co., New York City.]



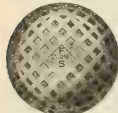
AMPHIBIAN SANDALS

A British manufacturer of tennis, gymnasium and other sporting shoes has put on the market a sandal intended for children which he calls the "Amphibian." It has an open upper, being fastened over the instep by straps, as shown in the illustration. Its distinctive feature lies in its rubber sole, which makes it a comfortable and springy shoe under all circumstances and enables the wearer to walk over wet grass or moist beaches and still keep dry-shod. [The Victoria Rubber Co., Limited, Edinburgh, Scotland.]



"F. & S. COLONEL" GOLF BALL

In the eyes of every player a golf ball that is long on the drive, but slow on the putting green; that flies fast and far from the tee, but stops dead on the pitch, would be the acme of perfection as an aid to high scoring. The "F. & S. Colonel" ball, evolved after several years' experimentation, is credited with these exceptional qualities. It is claimed that the movable center in the ball adds accuracy to its flight when driven from the tee; and on the approach, when given a back-spin, this center revolving against the momentum of the ball, causes it to drop dead, and in putting makes it as slow as a gutta percha ball. The recent patent covering its construction is described elsewhere in this issue. [St. Mungo Manufacturing Co. of America, Newark, New Jersey.]



TOY BALLOON VALVES.

THE manufacture of toy balloons is a highly specialized branch of the rubber business, requiring technical knowledge and special equipment, the successful development of which is due almost wholly to practical experience. There are innumerable types of these attractive toys made in variegated colors and all sorts of shapes, including effigies of various animals, imitations of footballs, watermelons and dirigibles. They are not all equipped with self-closing valves, which feature is a decided advantage as it permits inflation and deflation at will.

The original type of air valve was a simple disk of wood

around which the balloon neck was stretched. A round piece of thin sheet rubber was attached at one point to the inner part of the disk, covering the hole through which the balloon is inflated and acting as an air retaining valve.

These valves have been almost entirely superseded by the types shown in the illustration, that are interesting developments of the idea to make a cheap and satisfactory valve.

In the upper row are shown in side elevation three rubber types. Those on the right and left are molded, the one on the right being reinforced by a metal ring that is vulcanized in the lower part of the valve body. In both cases the air hole does not extend entirely through the body, sufficient stock being retained at the upper end which is afterwards slit, forming a flap that lifts when the balloon is inflated and closes by pressure from the enclosed air. A pin or match is inserted in the hole in the valve body and the valve raised, when it is desired to deflate the balloon.

A novel departure from the usual procedure is shown in the upper center view in which a small section of rubber tubing is employed as a closing auxiliary. This is slipped over the neck of the balloon which is then stretched over a round wooden



disk, provided with a hole in the center. When the balloon is inflated by the simple process of applying the lips to the wooden disk and blowing, the air is retained by giving the balloon a few turns to the right or left which closes the neck within the tube section. The air pressure against the end of the rubber tube prevents the neck from untwisting and the air is retained within the balloon. A few turns in the opposite direction will untwist the neck and the air then escapes.

In the lower row, inside views of the metal valves now in use are shown. These are stamped out of sheet tin and are all very similar in shape, size and design although there are some characteristics peculiar to each one which are of sufficient interest to describe in detail.

The one on the extreme left has a larger air opening than the others and the sides of the disk are straight, and formed with a projecting ear. This is bent down against the round disk of rubber sheet, holding a small section of it against the metal disk while the remaining portion of the rubber disk is free to act as an air valve.

The next valve is provided with an air opening of about $\frac{1}{8}$ inch and the edges are beaded, forming a groove to retain the neck of the balloon. A piece of spring wire is given the peculiar form necessary to retain its position within the metal body and at the same time hold the rubber disk in place.

The third valve shows about the same construction as the previous ones, with the exception, however, that instead of a spring retainer a cover is provided and the rubber disk allowed to move freely within the valve body.

The metal valve on the extreme right retains the same size, shape and general construction of its predecessors but discards all previous methods of holding the thin rubber disk in place. This disk is made very similar to an ordinary pump valve and is held in place by an annular groove on the inside of the valve body.

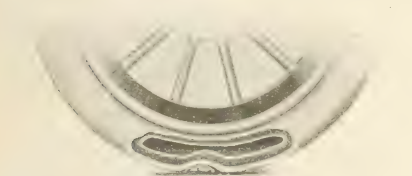
It is estimated that there are 20,000,000 toy balloon valves made in the United States each year.

THE DOUBLE SERVICE NON-INFLATABLE TUBE

A substitute for air in pneumatic tires which will retain all the resiliency, displacement and easy riding qualities of compressed air is offered by the makers of the "airless" tube.

This is made in an arch shape similar to a tire design and fits the inside of the tire perfectly—being inserted exactly like an ordinary tube. It is built of specially compounded springy rubber and fabric of a thickness that will retain the weight of a car and its load and permits of deflation or displacement whenever an object is struck or passed over. Its action is therefore the same as the ordinary pneumatic tire when in use. This tube requires no inflation, and as it only contains ordinary atmospheric pressure of 18 degrees, there cannot be punctures or blow-outs.

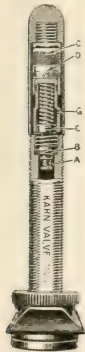
The illustration shows the tube action when passing over an



object. There is a displacement of air and rubber exactly the same as a pneumatic tire which prevents vibration or bouncing and results in easy riding qualities. [The Double Service Tire & Rubber Co., Akron, Ohio.]

THE KAHN VALVE

This new departure in tire valves combines a pressure gage and valve that in outward appearance is similar in size and shape to the ordinary inner tube valve. A novel feature is, that it can be set to the desired pressure and when that point is reached the unnecessary air is diverted through an outside port producing a whistling noise that serves as a warning. Referring to the illustration, the collar *C* is turned until a projection slips into one of the five slots marked 50, 60, 70, 80 and 90 pounds. The air is then turned on and when the point at which the valve has been set is reached, a check valve closes, due to the opening of the blow-off valve *E*, thus relieving the air pressure from the outside and allowing the pressure in the tire to close the inner check valve. All air now coming from the pump passes outside through the port *G*, with a whistling sound.

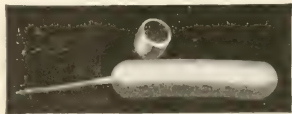


It is impossible to put more air into the tire than the pressure to which the valve has been set, as the area of the port *G* is greater than that of the inlet valve. The reason air does not escape through these ports before the desired pressure is reached is due to the pressure of a spring that acts on the blow-off valve and closes the ports until the pressure becomes greater than that of the spring.

Should it be desired to verify the tire pressure, the collar *C* is set at 80 and the top of the valve is pressed down. If the valve does not whistle it indicates that there is less than 80 pounds pressure. With the collar *C* set back to 70 pounds and the operation repeated, if the valve whistles it will indicate that the pressure is over 70 pounds. If it does not whistle at 70 the collar *C* is set back to 60 pounds and the operation repeated until the pressure in the tire is indicated. [Armstrong Rubber Co., Inc., New York City.]

A DEPENDABLE AIR BAG

The tire repair air bag is a very useful accessory that usually receives scant attention until the time comes for the accomplishment of its important part in repair operations. Then it



is resurrected from underneath the bench in a more or less neglected condition and expected to faithfully fulfil

its duty. All air bags should be well made and well taken care of, that good service and reliable repairs shall be the result. The illustration shows one that is specially constructed in a manner to fulfil the peculiar duties of an air bag.

According to the maker, the lining and frictioned fabric are made with a special non-blooming rubber compound that will withstand several hundred vulcanizations without losing its usefulness. Strength has been considered by using sufficient plies of the best cotton duck in the body and the entire bag is constructed with the idea that first cost is considered subordinate to satisfactory service. [The American Rubber & Tire Co., Akron, Ohio.]

HOOD AND PURITAN TIRES.

The "Hood" and "Puritan" tires are claiming serious attention from motorists who are interested in obtaining results in mileage and freedom from tire troubles. The claim of the makers is

that they are manufactured primarily to excel in quality and length of service, as a marked distinction from cheap and unguaranteed tires.

Among the points of superiority claimed for "Hood" tires may be mentioned that they are made with an extra ply of fabric, having on the small sizes one more, and on the larger, two more plies than the standard priced tire; the best quality of Egyptian fabric is used, every roll being tested before it is frictioned; the rubber is carefully selected from first quality Plantation and Para, and claimed to be compounded only with sulphur; the beads are locked in, and constructed to prevent rim cutting, while the cushion and breaker strips are made unusually wide, giving the tire extra strength.



ARROW TREAD.

The depressed type tread is extra wide, and made of tough stock, and the arrow-shaped non-skid depressions have very sharp edges that hold the road by suction.

The unusually long mileage obtained from these tires makes the cost per mile of the tire very low, although the first cost is higher than that of the standard tire because of the extra construction. This may be seen from the fact that, during 1915, the loss on the tires which came back to the factory for adjustment, on the basis of 5,000 miles, was less than one-half of one per cent.

They are made for every size and style of rim, in clincher, quick detachable and straight side types. [Hood Rubber Co., Watertown, Massachusetts.]



GRIPPER NON-SKID TREAD.

Replete with information for rubber manufacturers.—Mr. Pearson's "Guide Rubber and Compounding Ingredients."

News of the American Rubber Trade.

SEAMLESS RUBBER CO. SALESMEN CONVENT.

THE selling force of the Seamless Rubber Co., New Haven, Connecticut, recently held a convention in that city which, for enthusiasm and real business planning was most successful. The meetings lasted several days and were presided over by President James A. Murray, who informed the salesmen of the policy of broadening the field of operations by extended advertising in the national magazines and urged their co-operation. Each day was devoted to some special subject, the first being the plans for an aggressive campaign, the second for the discussion of methods of improving sales, a sample of every article made by the company being mounted on large screen frames for the salesmen's inspection, while sales arguments were formulated and discussed. One day was devoted to a demonstration and lecture on window trimming by Charles C. Stewart, of the Lee Advertising Service of New Haven, a temporary show window having been erected in which to illustrate the points of the lecture. The advertising campaign was explained by Frank L. Little, of the George Batten Advertising Agency of New York City. Various points regarding the coordination of the advertising and selling plans were given. The salesmen made their headquarters at the Hotel Taft, and the convention was fittingly rounded out by a banquet on the final evening.

WASTE MATERIAL DEALERS MEET.

A regular meeting of the National Association of Waste Material Dealers will be held September 19 and 20 at the Bellevue-Stratford hotel, Philadelphia, Pennsylvania. Besides the regular business of the association, it is expected that a considerable amount of time will be devoted to recreation, including automobile trips to places of interest in Philadelphia, excursions to Atlantic City, and a cabaret dinner. The committee having charge of the arrangements are Messrs. Murphy, Weil, White and McGarrity.

NEW CORPORATION WITH INCREASED CAPITAL.

The Vulcanized Rubber Co., Morrisville, Pennsylvania, which was incorporated under the laws of New Jersey in 1901, has sold and transferred all its property, assets, etc., to a new company bearing the same name, incorporated June 20, 1916, under the laws of Maine with a capital stock of \$1,500,000 (\$500,000 8 per cent cumulative preferred and \$1,000,000 common) and a meeting of the stockholders has been called to dissolve the former company. The stockholders are to receive one share of preferred stock and one share of common stock in the new company for each share held in the older company.

THE S. & W. RUBBER MANUFACTURING CO., INC.

The S. & W. Rubber Manufacturing Co., Inc. (See list of incorporations in this issue) is erecting a modern brick factory at Nineteenth street and Sixth avenue, College Point, New York. The officers are: Arthur C. Squires, president; George Jench, secretary; John E. Wainwright, treasurer. Inner tubes, dental rubber, dental dam, toilet and bath sponges, bathing caps, rubber heels and other molded goods will be made. An experimental laboratory completely equipped with miniature rubber machinery will be installed for the purpose of instructing and demonstrating the art of manufacturing all kinds of rubber goods. Experimental work will be done and inventors of rubber articles assisted in perfecting their ideas. This department will be under the personal direction of Arthur C. Squires, who is amply qualified for the position by long and varied experience.

WILSON RUBBER CO. PROMISES WELL.

The Wilson Rubber Co., Canton, Ohio, notice of whose incorporation appears elsewhere in this issue, has leased the plant formerly occupied by the Canton Rubber Co. and will make a specialty at the outset of electricians' and household gloves, and transparent nipples and pacifiers. It is stated that Fred Wilson, general manager of the new company, has secured from a man prominent in the rubber business in Germany a process for making a perfectly clear and transparent rubber, which will be used in future products of the company. Mr. Wilson has had nearly 25 years' experience in the rubber business and for the past ten years has been superintendent and factory manager of the Canton Rubber Co. In the management of the factory he will be assisted by John C. Moore and George W. Kocher, both of whom have had wide experience in the manufacturing of dipped goods.

PERFECTION RUBBER COMPANY PLANS LARGE OUTPUT.

The Perfection Rubber Co., Cleveland, Ohio, notice of whose incorporation appears elsewhere in this issue, is installing machinery and equipment for an output of 4,000 gross toy balloons and 200 gross household gloves per month, and expects to add considerably to that capacity within a short time. L. J. Johnson, formerly with the Faultless Rubber Co. and the Miller Rubber Co., is head of the manufacturing department. A. D. Wismar, of Cleveland, will have charge of the business end, as secretary of the company. Messrs. Johnson and Wismar, together with S. Korach, B. W. Korach and H. J. Barham, of the S. Korach Co., of Cleveland, form the directorate of the Perfection company.

RUBBER COMPANY DIVIDENDS.

The Hood Rubber Co. paid a regular quarterly dividend of 1 1/4 per cent. on the preferred stock on August 1 to stockholders of record July 28.

The Lee Rubber & Tire Corporation has declared a regular quarterly dividend of 50 cents and an extra dividend of 25 cents, both payable September 1 to stockholders of record August 15.

The directors of the Ajax Rubber Co. have declared the usual quarterly dividend of \$1.25 per share, payable September 15 to stockholders of record August 31.

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of shares of rubber manufacturing companies on August 25 are furnished by John Burnham & Co., 115 Broadway, New York City, and 41 South La Salle street, Chicago, Illinois:

	Bid.	Asked.
Ajax Rubber Co. (new)	63	66
Firestone Tire & Rubber Co., common	930	940
Firestone Tire & Rubber Co., preferred	112	114
The H. J. Goodrich Co., common	71 1/2	72 1/2
The H. J. Goodrich Co., preferred	113 1/2	114 1/2
Goodrich Tire & Rubber Co., common	23 1/2	24 1/2
Goodrich Tire & Rubber Co., preferred	106 1/2	107 1/2
Kelly-Springfield Tire Co., common	73 1/4	74 1/4
Kelly-Springfield Tire Co., 1st preferred	95	97
Kelly-Springfield Tire Co., 2nd preferred .....	.....	.....
Miller Rubber Co., common	220	225
Miller Rubber Co., preferred	105	106
Portage Rubber Co., common	130	131
Portage Rubber Co., preferred	130	135
Sunchem Tire & Rubber Co., common	95	100
United States Rubber Co., common	56 1/2	57 1/2
United States Rubber Co., preferred	113 1/2	114

JOSEPH P. DEVINE, INVENTOR AND EXPERT.

FIFTEEN years ago, a French scientist and an American mechanical expert at Niagara Falls were conversing on the subject of the conversion of a commercial scale of car-bide of calcium. The Frenchman finally said, "Sir, it cannot be done." The American said, "Come and see," and he took the scientist into an adjoining building and showed him eleven tons

of this product. The astonished scientist could only say, "Oh! That makes a difference!"

The American was Joseph P. Devine, whose name is well known in manufacturing circles, especially in rubber, in connection with the wide application of the vacuum dryer.

Mr. Devine was born in Philadelphia, January 4, 1867. His father, now 94 years of age, is still in perfect health. His mother,



JOSEPH P. DEVINE.

Sallie Paul, was a Quakeress, born in Philadelphia, and living her entire life in the house where she was born. The son was educated in the schools of his native city and lived there until about 20 years ago, when he moved to Buffalo. Previous to this, he had traveled extensively throughout Europe, and in one of his trips abroad began investigations on the use of the vacuum as applied to a wide range of materials. This resulted in the creation of a great plant for the manufacture of vacuum drying apparatus at Buffalo.

His special success lay in the application of vacuum drying, under reduced pressure, and by it he revolutionized many lines of industry. Of the products which have been made commercially possible through his studies, and carried out by the creation of special machines for the purpose, the list is a long one. It embraces the recovery of solvents; the application of oil heating to various chemical processes where exact regulation of temperatures is essential; the production of benzol, aniline oil, phenol, beta naphthol, trinitrotoluol, picric acid; all these are made commercially practicable or more economically produced through the study and inventive genius of the subject of this sketch.

It was Mr. Devine who installed the first vacuum dryers for crude rubber when every manufacturer in the United States firmly believed that air-dried rubber was the only good product. To-day practically all of the rubber is vacuum dried, and fabrics for rubberizing, as well. Mr. Devine has recently installed over 20 plants for the vulcanization of rubber boots and shoes under pressure, or in vacuo, which sounds the death knell of the old-time "dry heat" method. Mr. Devine was also one of the pioneers in the deseratinizing of gums and of low grade rubber, and his work in this line has been of great value to the rubber industry. To sum up for rubber, he has equipped establishments all over the world with dryers, impregnators, condensers, pressure vulcanizers, and apparatus designed by him and perfected in the works of the company of which he is the head.

Mr. Devine inherits the thorough-going traits of his Quaker

ancestry and the wit and brilliancy of his Irish forbears. He is versatile, resourceful and of indomitable energy, popular with those in his business establishment and possessing the confidence of the hosts of manufacturers whose problems he has solved and whose business he has revolutionized.

PERSONAL MENTION.

F. H. Gerrans has been appointed manager of the London branch of A. Schrader's Son, Inc., Brooklyn, New York, W. H. Cole, formerly in charge, no longer being connected with the company.

Seneca G. Lewis, general manager of the Pennsylvania Rubber Co., Jeannette, Pennsylvania, was married on July 3 to Mrs. Elizabeth McFall-McAfee in Sandusky, Ohio. Mr. Lewis and his bride are now settled in their home at Jack's Hill, Greensburg, Pennsylvania, the latter city being located about four miles from the company's plant at Jeannette.

Edwin N. Ohl was recently elected president of the New Castle Rubber Co., Pittsburgh, Pennsylvania, following upon the resignation of J. S. Wilson. W. H. Schoen and C. H. Bolton were made vice-presidents and E. H. Brainard, secretary. Mr. Ohl is also treasurer of the company.

E. M. Perdriau, managing director of the Perdriau Rubber Co., Limited, Sidney, Australia, was in New York City on business last month.

Frank G. Bolles, former manager of the export publication, "International Trade," Chicago, Illinois, has been chosen vice-president of the Russia Trade Corporation of America, a subsidiary corporation of R. Martens & Co., Inc. The former named company has opened an office in New York City and offices in several commercial centers in Russia, for the purpose of extending trade of American manufacturers in that country.

Harold R. Murdock has resigned his position as chief research chemist of the Rubber Regenerating Co., Naugatuck, Connecticut, to accept a position on the research staff of Charles Pfizer & Co., manufacturing chemists, Brooklyn, New York. Mr. Murdock has recently been granted several interesting patents on rubber reclamation.

G. H. Carnahan, formerly vice-president of the Intercontinental Rubber Co., with offices at 120 Broadway, New York City, has been elected president of the company.

T. K. Smetts, for two years representative of the service and advertising departments of the Firestone Tire & Rubber Co. at Des Moines, Iowa, has been transferred to the managership of the Spokane, Washington, branch of the company.

A. N. Rust, formerly salesman of the Minneapolis branch of The Fisk Rubber Co., Chicopee Falls, Massachusetts, has been made manager of the Fisk branch at St. Paul, Minnesota.

GOODRICH COMPANY APPOINTMENTS.

W. H. Sheehy has been appointed local manager of a new depot opened last month by The B. F. Goodrich Co., Akron, Ohio, at Estes Park, near Denver, Colorado.

John W. McCall has been succeeded as local manager at San Diego, California, by Warren F. Sanford.

C. L. Kelsey, Jr., formerly assistant manager at the Buffalo, New York, branch, has been appointed manager in charge at Cincinnati, Ohio, H. M. Spencer acting as assistant manager.

C. W. Simpson, formerly in charge at Cincinnati, will now devote his entire time to the district operating department and stock regulation department at Akron.

E. M. Lee, formerly assistant manager at the Cincinnati branch, has been given charge of the Denver, Colorado, depot.

ARTHUR JACKSON WILLS.

It is gratifying to introduce to the readers of THE INDIA RUBBER WORLD, and to the rubber trade in general, men who are active in promoting efficiency in the manufacturing processes of the industry.

The career of Arthur Jackson Wills as an inventor of special machinery began with his connection, about ten years ago, with



ARTHUR JACKSON WILLS.

the B & R Rubber Co., North Brookfield, Massachusetts. Mr. Wills is a New Yorker and a graduate of the Stevens Institute of Technology, in mechanical engineering. His first invention of special rubber making machinery was an automatic jar ring cutting lathe.

Supplementary to this machine, Mr. Wills invented a carton erecting and filling machine for counting and boxing jar rings.

Probably his most widely known invention is a trimmer for removing the

overflow from the edges of rubber heels or similar molded articles. These machines are installed in large groups in some of the most important rubber factories in America and Europe.

His latest development is a machine designed to produce the plated edging for bathing caps made from thin, pure rubber sheet or strip stock.

All of Mr. Wills' machines are most efficient and have been adopted by manufacturers of the lines to which they are adapted. He certainly is to be congratulated on the showing he has made as a designer of special rubber machinery, during the comparatively few years he has devoted to the needs of the rubber industry.

PEARCE-ARROW TIRE & RUBBER MANUFACTURING CO.

The Pearce-Arrow Tire & Rubber Manufacturing Co., Philadelphia, Pennsylvania, has purchased the assets and equipment of the Germantown Almegum Manufacturing Co., assigned, operating the plant leased under a purchase proposal, which has since been confirmed by the United States District Court.

The Pearce-Arrow company is making three grades of tires, a "Jit," "Standard" and "Puncture Proof," and turns out about 400 tires per day. A new building is being planned, to care for increasing demand, and the company hopes to have equipment installed allowing for a daily output of 800 tires in time for 1918 business. H. H. Allyn, formerly with the Canadian Consolidated Rubber Co. and later with the Lee Tire & Rubber Co., is the superintendent.

RAPID PROGRESS OF THE NORWALK COMPANY.

The output of the Norwalk Tire & Rubber Co., Norwalk, Connecticut, has been more than doubled during the past year, and is now operating at full capacity day and night and turning out in the neighborhood of 2,000 tubes and 200 cases daily. Dr. David Spence, the well-known technologist, has been vice-president and general superintendent of the company since its inception in the spring of March, 1914.

TRADE NOTES.

Dr. H. R. McCurdy has been appointed receiver of the McCurg Tire & Rubber Co., of Coshocton, Ohio. A suit for \$15,000 and inability of the company to market its product is given as the reason for the receivership. It is thought that this will be of short duration and that business will be resumed on the old basis, as there is said to be sufficient stock on hand to make this probable.

Important changes in the official force of the Perfection Tire & Rubber Co., Chicago, Illinois, resulted from a series of elections and appointments recently made. The officers and directors representing three companies which have been merged, including the Perfection Tire & Rubber Co., the Champion Automobile Co., and the Perfection Tire & Rubber Co. of Canada, Limited, will control all of the concerns. The present officers of the newly effected combination are C. R. Cole, president; R. J. Evans, vice-president; Charles W. Harris, secretary; E. A. Stickleman treasurer, and T. J. Mell, general manager. Mr. Mell was formerly assistant general manager of the Republic Rubber Co. Other executives who have been prominently identified with standard tire manufacturing companies are, Charles W. Harris, the secretary, formerly connected with the Kelly-Springfield Tire Co., and C. D. Whitston, the general sales manager, well known in connection with the old Diamond Rubber Co.

The American Auto Tire Co., 154 North Broad street, Philadelphia, Pennsylvania, has purchased the old Patterson Textile mills in Chester, Pennsylvania. The mills will be enlarged and converted into an automobile tire manufacturing plant. George G. Meeley is president, and Hugh B. Turner, secretary and treasurer. The Patterson mills are on a tract of six acres on Chester River and the line of the Philadelphia, Baltimore & Washington Railroad. The structures consist of the main building, of stone, 76 by 316 feet, three stories; a two-story brick building, 80 by 188 feet, a brick and frame building, 64 by 123 feet, a brick building, 33 by 74 feet; a brick boiler and engine house, and a two-story brick and stone office building.

The Braender Rubber & Tire Co., Rutherford, New Jersey, has moved its Philadelphia branch to 675 North Broad street.

At a recently held annual meeting of the shareholders of the Kansas City Tire & Rubber Co., Kansas City, Missouri, the following directors were elected for the ensuing year: P. E. Werner, Frank A. Werner, W. W. Wuchter, L. J. Smith, Harry Goodman, William R. Swissler and William Gould.

The Ohio Tire Service Co. has removed to 70 North Fourth street, Columbus, Ohio, where a greatly increased stock of Ohio tires and tubes will be carried. J. C. Henne, manager of the company, recently ordered five carloads of these tires for the Columbus store.

Suit was recently filed in the United States District Court to compel a number of alleged subscribers to the stock of the Dreadnaught Tire & Rubber Co., Baltimore, Maryland, to pay their subscriptions.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, has opened a service, repair and selling agency at Bismarck, North Dakota. This business was formerly handled through the Fargo branch.

The McGraw Tire and Rubber Co., East Palestine, Ohio, is increasing its capital stock to \$4,000,000; \$2,000,000 of which will be common capital stock; and \$2,000,000 of which will be 7 per cent cumulative preferred capital stock, redeemable at 110 and accrued dividends. \$1,000,000 of the new preferred stock has been underwritten by The Maynard H. Murch Co., Cleveland, Ohio, and will be utilized to retire the present outstanding issue and to furnish additional working capital to care for increased business; the remaining \$1,000,000 of preferred stock will be placed in the treasury to care for future growth and expansion.

TRADE NOTES.

At a recent meeting of the board of directors of the Victor Rubber Co., Springfield, Ohio, it was voted to increase the capital stock of the company from \$300,000 to \$750,000, and to declare a 100 per cent stock dividend on common stock, made possible by the last year's earnings.

The United States Rubber Co. takes advantage of conventions of retail shoe dealers to advertise its footwear by demonstrators. At the recent convention of the Illinois Shoe Dealers' Association, J. J. Hawkins showed practically the operation of making a rubber boot, giving a description of all the different processes, from the crude rubber to the finished product, and building up a boot upon a last while explaining the same in detail.

The three-story plant addition of the Anderson Rubber Works, Anderson, Indiana, which is nearing completion, will bring the total floor space of the company in actual use up to 50,000 square feet. The new addition, which is 86 by 60 feet, and adjoins the factory at 14th and Meridian streets, is being erected to care for the fast growing demand for the Miller vulcanizer, which is one of the company's important lines.

The Eagle Rubber Co., Ashland, Ohio, notice of whose incorporation appeared in the August issue of THE INDIA RUBBER WORLD, has purchased an acre of ground centrally located along the Erie right of way opposite the Erie station and will erect a brick building of about 150 feet in length and 60 feet in width, three stories, including basement. The company expects to materially increase its output of toy balloons and will also undertake the manufacture of various rubber sundries. H. R. Gill is president and treasurer, and H. V. Pohle, general manager.

The annual outing of the employees of the Pennsylvania Rubber Co., Jeannette, Pennsylvania, was recently held at Idlewild and attended by more than 2,000 persons.

John W. Maguire, Chicago branch manager of the Republic Rubber Co., and chairman of the house committee of the Chicago Automobile Club, is trying a novel experiment with all automobile clubs in the United States and Canada, acting in cooperation with President W. O. Duntley, of the Chicago Automobile Club and the board of managers. Briefly, the plan is to extend the privileges of the club to all members showing credentials indicating good standing in their clubs. It is an exchange of courtesies which has resulted very satisfactorily in connection with ordinary social clubs.

The Hunter Dry Kiln Co., Indianapolis, Indiana, is building a drying laboratory adapted for the working out of drying problems. Any one having a drying proposition that they desire to have solved may refer it to the laboratory of the Hunter Dry Kiln Co. This process is as well adapted to the drying of compounds as it is to crude rubber.

The employees of the executive offices of the United States Rubber Co. in New York City have, on their own initiative, formed a company of infantry and are drilling twice a week at the armory of the Twelfth Infantry, N. G. N. Y., the use of this armory having been donated for the purpose. The services of a former officer of the National Guard have been secured as instructor. This is another example of the preparedness campaign now in progress.

The plant formerly operated by the Blodgett Rubber Co. at St. Joseph, Michigan, has been taken over by the recently organized Palmer Rubber Co. It is estimated that the new company will commence operation on September 1.

The Mattson Rubber Co., Lodi, New Jersey, has filed notice with the county clerk at Bergen indicating a change in the issuance and classifications of its capital stock, the purpose being to divide it into 100 shares preferred and an equal amount of common stock.

The Allen Machine Co., Erie, Pennsylvania, has increased its capital stock to \$200,000 and is building an addition to its present plant which will enable the company to handle the heaviest class of work. This addition will be 60 by 180 feet with a 20-ton electrical crane serving the entire floor space.

The malleable iron foundry of the Link-Belt Co., Indianapolis, Indiana, is being enlarged by a one-story extension, 70 by 275 feet, with a wing 106 by 140 feet in dimensions. This addition will house the fifth melting furnace of the company and provide space for 60 molders.

In order to increase its factory facilities to allow for a future output of 500 automobile tires per day, the capital stock of the Vail Rubber Co., Chicago, Illinois, has been increased to \$100,000, all of which has been paid in. At present the Vail company has a capacity of 265 tires but is only making 200 per day. The officers of this company are as follows: Adolph C. Ehnman, president and treasurer; W. A. Vail, vice-president, and Francis Lackner, secretary.

The Board of Trade of Girard, Ohio, have in contemplation the establishment of a plant for the manufacture of rubber specialties. According to plans discussed the proposed company will be capitalized for \$200,000.

The Hamilton Rubber Co., Trenton, New Jersey, has opened offices at Atlanta, Georgia, which will be the headquarters for the States of Georgia, Atlanta, South Carolina and Florida. H. B. Scheisinger will manage the southern branch and will be assisted by F. L. Martinez. This company makes tires, tubes and mechanical goods.

A. B. McVay has resigned as secretary of the Bucyrus Rubber Co., Bucyrus, Ohio, and has been succeeded by G. P. Mader.

Interesting statistics concerning the United States Rubber Co. and subsidiaries show that the company owns plantation property in Sumatra covering 90,000 acres representing an investment of nearly \$9,000,000. In its 47 factories the company employs 35,000 people and its yearly production fills 15,000 freight cars, a train 112 miles long. It is said to consume in the manufacture of its various products more than 55,000,000 yards of cotton fabric yearly.

The Iowa Rubber Co. has been recently organized and expects to locate at Davenport or Bettendorf, Iowa. This section of Iowa is said to be an eligible location, both from a labor and distribution viewpoint. Chief among those interested are: J. W. Bettendorf, J. R. Lane and Judge J. W. Bollinger.

The Republic Rubber Co., Youngstown, Ohio, is working double shift in every department. The company has made shipments to 22 foreign countries this year.

Creditors of the New York Commercial Co., 290 Broadway, New York City, have received a final dividend of 1½ per cent, making a total dividend of 39½ per cent. The company went into bankruptcy on April 12, 1913, with liabilities of nearly \$2,000,000.

The Standard-Woolen-Fabrics Co., Walpole, Massachusetts, has sold its Framingham factory. This company recently acquired the old plant of the Walpole Rubber Co., and is making a variety of rubber specialties.

The death of P. Carter Bell, of the Carter Bell Manufacturing Co., New York City, manufacturer of rubber substitutes, will in no way interfere with the business of the company. All of Mr. Bell's formulae will be continued in use and no interruption will be caused by his demise.

Gustave Kusch, well-known manufacturer of printers' blankets, 3 Park Row, New York City, has succeeded in developing a certain type of specially cured tubing in active request in hospitals and laboratories. As this tubing was formerly an exclusively European product, Mr. Kusch's invention will materially promote the convenience of consumers in this country.

NEW INCORPORATIONS

American Banana Products Co., August 7 (Delaware), \$100,000. Henry T. Farrow, Norman P. Coffin, Wilmington, Delaware, and Clement M. Egner, Elkton, Maryland. Principal office, Corporation Trust Co. of America, 394 duPont Building, Wilmington, Delaware. To acquire plantations for the cultivation of bananas, rubber, etc.

American Puncture Seal Co., Inc., August 7 (New York), \$1,000. William E. Hendry and Hulda G. Hendry, 1461 St. Peters avenue, and Alice M. Waters, 2466 Frisby avenue—all of New York City. To manufacture puncture healing liquid.

Anderson Tire Manufacturing Co., July 22 (Delaware), \$100,000. James C. Anderson, William W. Anderson, George A. Rock—all of Washington, D. C. To manufacture tires, etc.

Beacon Tire Co., Inc., July 31 (New York), \$100,000. Edward C. Griffith and K. G. Johnston, 1625 Broadway, New York City, and H. A. Demarest, Los Angeles, California. To manufacture auto and motor tires, etc.

Bradshaw Tire & Rubber Co., Inc., June 24 (Illinois), \$10,000. C. E. Bradshaw, William M. Gentleman, Jr., and George S. Atwater. Principal office, 1337 S. Michigan avenue, Chicago.

Carnegie Tire & Rubber Co., Inc., August 23 (New York), \$25,000. Roland J. Reynolds; Victor W. Fink, and William H. Dodd—all of 69 Wall street, New York City.

Central & South American Chicle Co., The, July 7 (Delaware), \$2,000,000. José P. Cuellar, Caracas, Venezuela; B. L. Atwater, Garden City, New York; Julian A. Arroyo and Miguel Gonzalez Rincones, New York City; C. L. Rimlinger, Herbert E. Latter and Norman P. Coffin, Wilmington, Delaware. Principal office, Corporation Trust Co. of America, 394 duPont Building, Wilmington, Delaware. To manufacture and deal in raw chicle or any other kind of chicle or gum.

Col. Brown Tire Co., July 24 (California), \$500,000. Henry D. Boddington, C. H. Braden, A. D. Denison, James Edmunds, Bert C. Smith—all of Los Angeles—and Mattison B. Jones and O. A. Lane—both of Glendale, Los Angeles County, California. Principal office, Los Angeles, California.

Cut Price Auto Tire Co., July 27 (New Jersey), \$100,000. Herman Fineberg, Isaac Fineberg and John L. Heher—all of Trenton, New Jersey. Principal office, 12 East Hanover street, Trenton, New Jersey. To deal in tire and automobile accessories, etc.

Eckrode Rubber Co., C. E., Inc., August 2 (New York), \$50,000. C. E. Eckrode and Otto Wuest—both of Highland Park, and Andrew Perkins, 17 Water street—both in New Brunswick, New Jersey. To manufacture rubber goods and novelties.

Falcon Chicle & Lumber Exploitation Corporation, August 24 (New York), \$100,000. Francisco Garcia, John O. Perez and Alexander Lamont—all of 68 William street, New York City. To produce chicle, etc.

Federal Tire & Repair Co., The, June 26 (Tennessee), \$3,000. L. A. Wallace, B. J. Hughes and Will R. Manier, Jr.—all of Nashville, Tennessee. Principal office, Eleventh avenue and Broad street, Nashville, Tennessee.

Fibre Rubber Manufacturing Co., Inc., July 20 (Delaware), \$500,000. A. J. Sherman, Ferris Giles, L. S. Dorsey—all of Wilmington, Delaware. Principal office, Colonial Charter Co., 927 Market street, Wilmington, Delaware. To acquire letters patent for the manufacture of rubber goods of all kinds.

G. A. Aeronautic Co., Inc., The, August 4 (New York), \$105,000. Charles H. Bassford, 38 North 12th street, Newark, New Jersey; Samuel W. Mower, 66 West 85th street, and Joseph E. Rogers, 203 West 108th street—both in New York City.

Goodyear Tire Co., The, January 4 (Minnesota), \$300,000. Harry A. Trenholm, Minneapolis; Gust W. Franson and Charles W. Oberg, Deerwood—both in Minnesota. Principal office, Minneapolis, Minnesota. To manufacture auto tires and automobile accessories and supplies.

Hipwood International Pneumatic Crutch Co., Inc., August 8 (New York), \$250,000. George Hipwood, Hotel McAlpin, New York City; John W. Barrett, 62 Temple street, Somerville, Massachusetts, and Carmac F. Egan, 382 East 168th street, New York City.

Indian Tire & Rubber Co., July 19 (New Jersey), \$100,000. Elmer W. Van Ness, Mountain View; Adelbert Hauschild, 29 Morris street, New Brunswick, and Willard P. Fraley, 127 Benner street, Highland Park—all in New Jersey. Principal office, 320-6 Commercial avenue, New Brunswick, New Jersey. To manufacture and deal in all kinds of rubber goods.

J. T. Johnstone & Co., Inc., August 19 (New York), \$200,000. Albert F. Jaekel, Adele M. Ferre, 32 Liberty street, and Douglas Haldane, 22 William street—both in New York City. To manufacture rubber goods, operate rubber plantations, etc.

Kelsey Wheel Co., Inc., August 23 (New York), \$13,000,000. Elmer F. Holmes, 37 Wall street; Allen E. Moore, 20 Arden street—both in New York City, and Donald Havens, 55 Hanson Place, Brooklyn, New York. To manufacture wheels, rims, auto parts, etc.

Maple Leaf Tires, Ltd., June 3 (Canada), \$500,000. Rupert K. Grimshaw, Edward J. Swift and Harry C. Long. To manufacture automobile tires, tubes, truck tires, belting and all rubber sundries.

McNaull Tire Corporation, August 4 (New York), \$500,000. Edward H. Power, 108 West 57th street; Farron S. Betts, 410 Riverside Drive—both of New York City, and Joseph W. Murphy, 189 Eighth avenue, Brooklyn, New York. To manufacture tires and rubber goods.

Mee-Tu Tire & Rubber Co., July 31 (Pennsylvania), \$5,000. Thomas G. Meeley, George G. Meeley, 5,000 Pine street; Lester U. Weaver, 5447 Lansdowne avenue—all of Philadelphia, Pennsylvania. Principal office, Chester, Pennsylvania. To manufacture and deal in automobile tires, tubes, accessories, junk, etc.

Muller Tire & Rubber Co., July 7 (Oklahoma), \$15,000. Alfred Muller, San Antonio, Texas; A. L. West and R. J. Uehlinger, Tulsa, Oklahoma. Principal office, Tulsa, Oklahoma. To buy and sell all parts and appliances used in connection with motor vehicles, etc.

Nashua Rubber Co. of Nashua, August 4 (New Hampshire), \$5,000. Fred A. Jewell, Lawrence; George I. Crocker, Fitchburg—both in Massachusetts; Guy W. Swallow, Nashua, New Hampshire. Principal office, Nashua, New Hampshire. To manufacture and deal in rubber goods, etc.

Newark Auto Supply Co., June 30 (New Jersey), \$25,000. Nathan J. Berkowitz, Newark; Abraham G. Weinberg, Harrison; Samuel G. Salls, Plainfield, and Harry Roth, Irvington—all in New Jersey. Principal office, 304 West Front street, Plainfield, New Jersey. To deal in automobile accessories, etc.

New Tread Tire Co., The, June 17 (Kentucky), \$5,000. David H. Smith, T. W. Price, A. L. Smith. Principal office, Louisville, Kentucky. To deal in automobile accessories, etc.

North American Rubber Co., July 24 (New Jersey), \$250,000. S. S. Adams, Jr., H. M. Kennedy and M. B. F. Hawkins—all of Wilmington, Delaware. Principal office, 143 East State street, Room 210, Trenton, New Jersey. To manufacture and sell the Mercer Non-Blowout Inner Tube, to make rubber covered poles and to go into the rubber business in general.

Pennsylvania Rubber Co., Inc., August 21 (New York), \$6,000,000. Seneca G. Lewis and H. W. Dupuy, Jeannette, Pennsylvania, and G. A. McLaughlin, 61 Broadway, New York City. To manufacture tires and rubber goods.

Perfection Rubber Co., The, July 7 (Ohio), \$40,000. L. J. Johnson, A. D. Wismar, S. Korach, B. W. Korach and H. J. Barham. Principal office, 2097-2107 Columbus Road, S. W., Cleveland, Ohio. To manufacture and deal in dipped goods, druggists' sundries and rubber specialties.

Post Tire & Rubber Corporation, August 1 (Delaware), \$1,500,000. William F. O'Keefe, George G. Steigler and E. E. Wright—all of Wilmington, Delaware. Principal office, Corporation Co. of Delaware, Equitable Building, Wilmington, Delaware. To manufacture and deal in automobile tires, tubes, casings, etc.

Rubber-Aid Co., The, August 9 (Ohio), \$10,000. David Rubin, Max Schwab, Sam Rubel, Abe Efron, and Abe Isralsky—all of Cincinnati, Ohio. To manufacture surgical goods.

Rubber Co. of America, July 7 (New Jersey), \$25,000. Judson G. Campbell, Rutherford; Julius Greenfield, West Newark—both in New Jersey, and Charles Heimlich, 362 Bleeker street.

New York City. Principal office, Broadway, corner St. Louis avenue, West Newark, New Jersey. To manufacture and deal in rubber goods, etc.

Quabaug Rubber Co., August 3 (Massachusetts), \$125,000. Thomas G. Richards, North Brookfield; Frank C. Smith, Jr., and J. Otis Sibley, Worcester—both in Massachusetts. Principal office, North Brookfield, Massachusetts. To manufacture rubber heels, soles and all other rubber goods and goods made of rubber compounds or other substance, etc.

Shaw Tire Co., July 10 (Massachusetts), \$300,000. A. B. Shaw, 23 Bowers street, Medford; Edgar E. Fay, 34 Beacon street, Newton, and William V. Burton, 7 Irving street, West Medford—all in Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in tires, tubes, etc.

Stungo Radium Rubber Co., August 10 (Delaware), \$1,000,000. Harry T. Farrow, M. V. Haywood—both of Wilmington, Delaware, and Clement M. Egner, Elkton, Maryland. Principal office, Corporation Trust Co. of America, 394 duPont Building, Wilmington, Delaware. To manufacture and deal in chemicals, rubber and any goods of which rubber is a part.

Superior Tire & Rubber Co., July 18 (Maine), \$500,000. E. M. Leavitt (president), Winthrop, and Ernest L. McLean, Augusta—both in Maine. Principal office, 242 Water street, Augusta, Maine. To manufacture and deal in tires.

S. & W. Rubber Manufacturing Corporation, The, August 16 (New York), \$10,000. Arthur C. Squires (president); Thomas J. Smith, 637 10th street; John Wainwright and Edward Jockers, 13th street—all in College Point, Long Island. Principal office, 19th street and Sixth avenue, College Point, Long Island. To manufacture inner tubes, rubber heels, dental rubber, etc.

United Securities, August 5 (Maine), \$50,000. Fred F. Phillips (president and treasurer) and George H. Hinckley (clerk)—both of Portland, Maine. To manufacture rubber, etc.

Wilson Rubber Co., The, July 18 (Ohio), \$40,000. Fred Wilson, John S. Willis and Wendell Herbruck. Principal office, 1320 Fifth street, N. E., Canton, Ohio. To manufacture dipped rubber goods.

manufacture inner tubes next season. A. J. Stephens, who has been in the tire jobbing business for the past six years, as owner of the Stephens Motor Tire Co., of Kansas City, is general manager of the McFall company. L. E. McFall is superintendent. Mr. McFall formerly held a similar position with the Western Tire & Rubber Co., of Kansas City, and has been in the manufacturing business for the past seven years.

FEDERAL RUBBER CO.'S OUTING.

The office force and factory heads of the Federal Rubber Co., Cudahy, Wisconsin, held an outing at Keippner's Park one day last month, and the camera proves that they thoroughly enjoyed

themselves on that occasion. An interesting program of athletic sports was successfully carried through. A leading feature of the day was a ball game between the office force and the factory representatives, which was won by the latter.

The penalty to be paid by the losers of the game is a banquet for both nines, to be held later. The outing was concluded by a banquet in the evening.



FEDERAL RUBBER COMPANY OUTING AT KEIPPNER'S PARK.

FRENCH ARMY FOOTWEAR.

The Canadian Consolidated Rubber Co., Limited, Montreal, Canada, has contributed many men to the Dominion troops which have gone to the front in the great European war. The business and the mechanical departments are represented in both rank and file, and much valor has been shown in regimental and individual cases.



This company has furnished the British government many thousand pairs of trench boots, showing wonderful despatch in filling orders for this necessary footwear. On this page is shown a company of Canadian infantry "somewhere in France," each man wearing a pair of the trench boots, made in Canada.

PROGRESS OF THE McFALL RUBBER COMPANY

The McFall Rubber & Manufacturing Co., Kansas City, Missouri, which began manufacturing tire accessories, blow-out patches, reliners, fan belts, etc., in March, last, is now working full blast, with 60 employees. A complete line of tire accessories is being made and the company expects to

THE OBITUARY RECORD.

PROMINENT IN RUBBER CHEMISTRY.

PERCY CARTER BELL, president of the Carter Bell Manufacturing Co., New York City, died at his residence at East Orange, New Jersey, August 23, aged 49 years. Mr. Bell was born at Manchester, England, August 28, 1867. He was the son of J. Carter Bell, an eminent chemist, and chose his father's profession, graduating with honors from Victoria University.

Choosing the manufacture of rubber for a special field he secured employment with prominent concerns in that line in England. He came to America about 25 years ago, and after a year in the chemical department of the New York Belting & Packing Co., he opened a technical laboratory in New York City in 1893, devoting himself as analytical and consulting chemist for the rubber trade.

In 1894 he formed

a partnership with Curtis P. Smith to manufacture chemically pure chloride of sulphur, and also a rubber substitute of his invention. This concern was incorporated three years later as the P. Carter Bell Co. and in 1903 the present concern, the Carter Bell Manufacturing Co., was incorporated.

Mr. Bell some years ago contributed to the columns of THE INDIA RUBBER WORLD, his articles on the effect of various chemicals and materials on caoutchouc being specially instructive. He was a most companionable man and had a host of friends in the rubber and chemical industries.

Mr. Bell was prominent in the Masonic fraternity, being a past master of the lodge at East Orange. He leaves a widow.

QUEBEC'S RUBBER SCRAP EXPORTS AND GOODS IMPORTS.

According to the Annual Report for 1915 by the American Consul at Quebec, Canada, \$122,356 of rubber scrap was exported to the United States, as against \$117,017 in 1914; showing an increase of \$5,339.

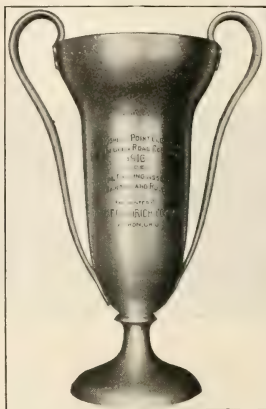
During 1915 the Province of Quebec imported \$27,623 of manufactures of rubber and gutta percha, of which \$17,667 was from the United States. The previous year these imports amounted to \$32,348, of which \$11,448 was from the United States; showing that, while the total imports of rubber and gutta percha goods increased by \$4,725, the imports of the same merchandise from the United States decreased to the extent of \$6,219.

The crude rubber sausage has always held its place in the world of raw rubber, but the rubber sausage as a more or less dainty edible is an innovation, again reflecting German ingenuity. Word comes from Berlin to the effect that a certain Hamburg merchant has been fined 2,000 marks for a unique violation of the pure food laws. The offense committed by this enterprising purveyor of delicatessen consisted in the selling of a commodity purporting to be liver sausage for 2 marks and 20 pennings a pound, which proved on analysis to contain macerated rubber, finely ground hair and gelatine. It was absolutely guiltless of liver, other flesh or fats.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

TRUE sportmanship is shown by The B. F. Goodrich Co. in the conditions governing its award of the hammered silver trophy cup shown in the accompanying illustration. Although



the Goodrich company is a maker of bicycle tires, among which is the famous Palmer tire used by many racers, it is expressly stated that riders contesting for this trophy may use any make of tire they wish. The bicycle club team scoring the highest number of points in open road competition during 1916 will win the cup. It is valued at over \$400, and, as will be seen, is of graceful, chaste design, with clear-cut explanatory lettering under the space left for the winner's name. Bicyclists and cycle fans are all

anxious to see this unusually handsome trophy, and the company is therefore sending it on tour to the larger cities, while in other cities full size reproductions are being displayed as hangers. In order to have the points count, all races must be sanctioned by the National Cycling Association and conducted under its rules.

The Goodrich company is also making things interesting in the driving competitions for 1916, by announcing \$10,000 in awards to racing champions during the year, the rules governing the competition to be determined by the American Automobile Association, based on the length of each contest, the field of starters and the character of the race. Although the Goodrich Silvertown cord tire is deservedly popular in speed contests, no stipulation is made as to the make of tire to be used by the contestants. The money will be awarded as follows: \$5,000 for the champion; \$3,000 for second in number of points, and \$2,000 for third.

On Goodrich outing day, held during the past month, \$15,000 was distributed to employees, each employee being given one dollar to spend as he desired. Many of them attended the great Akron factory picnic at Cedar Point, arranged by the Whitman-Barnes relief association and the Brotherhood of Railway Trainmen.

C. O. Littlefield, who has been in the employ of the Goodrich company less than two years, has recently been promoted to a responsible position in the Trade Record department at the Akron office.

The Goodrich Athletic Association has sent a challenge to the Goodyear and Firestone athletic associations for a triangular track and field meet on the new Goodrich athletic field in October. The field will be opened on Labor Day by the employees of the Goodrich company by a big field and track meet for which 300 entries have been received from the Goodrich forces. The athletic contest between the three rival tire companies of Akron will take place in October.

The Firestone Tire & Rubber Co. is conducting an extensive plan of window displays in all its branch agencies. Appreciating the value of attractive exhibits, F. S. Babcox, manager of the advertising department, has had made various cut-outs, show cards, etc., for such use, and these are arranged in a window at the factory and photographed. Then these various accessories are shipped to the agencies, together with the photograph, by which means the display can be duplicated in all the principal cities. The illustration shown is one of these displays.



A folded cardboard background is handsomely lithographed in colors, while the signal posts are cut out and arranged to stand upright in the window, the rest of the display being taken from the stock of goods in the store. Another has a large picture of a cyclist and a motorcyclist being photographed by a "movie" camera man, whose cut-out, electrically-propelled arm, turning the crank, is an eye-catcher. This campaign has now gained such prominence, that the agency windows in various cities are regularly observed by many for the changes.

On August 26 the foremen, superintendents and officials of the Firestone company, to the number of 225, held their annual outing. Early in the morning 50 automobiles carried them to the large farm of Amos C. Miller, vice-president of the company, at Castalia, where a sumptuous midday dinner was heartily enjoyed. The early afternoon was spent in ball games, quoits, etc., after which the entire party journeyed to Cedar Point, Sandusky, where they were the guests of President Firestone. Bathing in Lake Erie was followed by supper at the Hotel Breakers and the following morning, after breakfast at the hotel, they returned to Akron.

Harvey S. Firestone, Thomas Edison, Henry Ford and John Burroughs, the naturalist, are "roughing it" together in the Adirondacks.

Mention has been made of the remarkable department in the factory of the Goodyear Tire & Rubber Co. composed entirely of deaf mutes, whose affliction only serves to heighten their efficiency in factory work. For some time a fraternity has existed among this band of workers, and a club has now been formed to promote good fellowship among them. The Goodyear officials cooperate in every way to conserve the safety and add to the pleasure of this department, and many of the deaf mutes are very good athletes, contending for Goodyear honors on the football, baseball and basketball teams.

The name of the safety department of the Goodyear company has been changed to that of "police department," with P. J. Hutchison as police chief. Goodyear police patrol the factory and have authority to stop all dangerous work, and censure or discharge careless workmen.

A "Suggestion System," in use by the Goodyear company, encourages employees to offer ideas for improving machinery, methods, conditions and product in the factory, hundreds of dollars being paid annually to the employees for suggestions accepted by the company.

Shelby A. Falor, manager of the motorcycle tire department of the Goodyear company, has been elected president of the Federation of American Motorcyclists.

The General Tire & Rubber Co. has applied for an increase of capital from \$200,000 to \$500,000, to care for the growing demands of its business. A 60 by 200-foot addition is soon to be erected, which will be used for an additional tire building room.

M. O'Neil, president of the The General Tire & Rubber Co., has leased to F. A. Seiberling, president of the Goodyear company, the eight-story Ohio Building and a large plot of land adjoining. This office building has been completed less than a year and contains the quarters of The Akron City Club, a new organization of Akron business men, the club occupying the three upper stories of the building.

The Portage Rubber Co. has just completed a three-story building, 60 by 80 feet in dimensions, that is being used for manufacturing automobile tires, and has begun the erection of a two-story building, 50 by 150 feet, the lower floor of which will be used for a shipping room and the upper floor as a stock room for tires and tubes. All the buildings of this company are of structural steel construction surrounded with concrete and brick.

The \$250,000 worth of new preferred stock of the company, mentioned last month, has all been taken by the stockholders at 105 per share and paid for on August 1.

A two-story building of the Miller Rubber Co., in which chemicals were stored, was recently burned to the ground.

P. H. Goodall has been made assistant sales manager of the Mohawk Tire & Rubber Co. Mr. Goodall was formerly branch manager in Cleveland for the United States Tire Co.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

THE vacation season is about over. Many of the mills shut down during the excessively hot spells of the past month and took this opportunity for making such alterations and improvements as will put them in proper shape for the large amount of business which they have on hand for the coming season. Most lines of the rubber business are in pretty good condition, with enough orders on their books or business in prospect to keep them going well along into the season, and the outlook for orders during the early fall is most encouraging. There is a diversity of opinion as regards the tire business, some producers reporting orders ahead of production, and others admitting that they could do more business than they have on hand. In rubber boots and shoes, the manufacturers have had a busy season and have not caught up, so the summer shutdowns have been shorter than in some former years. It is evident that retail stocks in rubber footwear were practically sold out last winter and, as a consequence, large orders were taken by every producer—in fact, the capacity of every factory has been strained in order to be able to deliver the early fall orders. Mechanicals have felt the effect of the spring and early summer weather as regards the garden hose business, and it is evident that a considerable amount of last year's goods are still in retail stocks. The demand for rubber belting in part makes up for the loss of the hose trade, the

present position of the leather belting industry being such that the demand for rubber belting has very largely increased. Druggists' sundries manufacturers report a good seasonal business.

The Hood Rubber Co. will remove its Boston office from Bedford street, where it has been ever since it started in business, to the new 11-story building at the junction of Summer and High streets, which is now nearing completion. The Hood company will occupy a portion of the eighth floor, which is now being fitted up for a sales room and sample room. The accounting, business and executive offices will remain at the factory in East Watertown. The Boston headquarters will be presided over by W. W. Richardson, who for some years has welcomed all visitors to the factory and guided them to the several departments. With him will be Proctor Caldwell, city salesman for the Hood Tire Co., Inc.

This new building, which is one of the most noticeable in the vicinity of the South Terminal Station, stands upon historic ground. For years Daniel Webster made his home in the granite residence which had to give way to the onward course of business. He was living there when he took part in the historical India Rubber case. The new building represents a monument to the indomitable energy of William B. Rice, who began life as a shoemaker and who, before his death, had made his name and his shoes known in five continents, and who, for several years, placed upon the market a line of rubber footwear branded with the name of Rice & Hutchins.

The 700 men and women employed by the Revere Rubber Co. who went on a strike about the first of June are now back at work, the company having agreed to raise wages \$1 per week, to make the working week for men 54 hours and for women 53 hours, and to settle departmental grievances by conferences with shop committees.

Mention was made in THE INDIA RUBBER WORLD of the formation of the Rubber Heel Club of America for the purpose of securing closer relations between manufacturers and jobbers; correcting trade abuses; educating the general public in the use of rubber heels, and improving conditions relating to the rubber heel industry. Since that time the organization has been perfected at a meeting held in this city, resulting in the election of the following officers: Robert H. Cory, O'Sullivan Rubber Co., president; George A. Stetson, Elastic Tip Co., secretary and treasurer, whose office is at 370 Atlantic avenue, Boston. Mr. Cory is also on the board of directors, of which the other members are C. H. Oakley, Essex Rubber Co., and Charles Measure, Federal Rubber Co. The present membership includes the following firms:

Elastic Tip Co., Boston, Massachusetts.
Essex Rubber Co., Trenton, New Jersey.
Federal Rubber Co., Cudahy, Wisconsin.
Foster Rubber Co., Boston, Massachusetts.
Goodyear Tire & Rubber Co., Akron, Ohio.
O'Sullivan Rubber Co., New York City.
Panther Rubber Manufacturing Co., Stoughton, Massachusetts.
Plymouth Rubber Co., Canton, Massachusetts.
Revere Rubber Co., New York City.

Mention was made in THE INDIA RUBBER WORLD last month that the business of the B & R Rubber Co. had been purchased by Thomas G. Richards. Since that time a Massachusetts corporation has been organized, with a capital stock of \$125,000, under the name of the Quabang Rubber Co., which has purchased from Mr. Richards all the assets and

business of the B & R Rubber Co. Mr. Richards is president and treasurer of the new company, and the board of directors consists of Mr. Richards, of North Brookfield; J. Otis Sibley and Frank C. Smith, Jr., of Worcester. There has been no interruption of the work since the B & R company went into the hands of the receiver and the plant is now running to nearly full capacity in the same lines of goods which were manufactured by the old company, prominent among which are tubings, baby carriage tires, mats and the Armortred and Barco soles, the former for shoe repairers and the latter for shoe manufacturers.

Several hundred employees of The B. F. Goodrich Co. from all over New England participated in the annual outing held at Riverside recreation grounds on August 8. It was one of the hottest days of the season, but the water in the Charles River was found to be most comfortable for bathing purposes and there was no lack of canoeing up and down the river. There were a variety of field and river contests, the latter including a 20-yard dash under water and a diving contest, and some of these events afforded great amusement for the onlookers. A prize was given the handsomest baby attending the outing. The committee having charge of the outing is to be congratulated on the perfect success of the whole affair. This committee consisted of Fred T. Moore, the New England manager; W. H. Moore, F. W. Tucker and C. F. Conner. The committee on sports was "Tom" Donnellan, E. S. Clark and H. J. Slaman.

The second annual field day of the employees of the Boston Woven Hose & Rubber Co. was held at Riverside recreation grounds on July 29, more than 1,000 persons attending. Special trains carried the party to and from the grounds. There were track and field events and a baseball game. A band concert and dancing were also features of the occasion. The tennis team of this company was defeated 4-3 by one from the Edison Illuminating Co., which carried off the prize, a handsome loving cup. The outing was under the auspices of the Mutual Benefit Association of the company and the arrangements were in charge of a committee of which James H. O'Brien was chairman.

The clothing factory of the American Rubber Co. at Stoughton, formerly the Stoughton Rubber Co., is now adding a story to one of its big wooden buildings, the object of which is to still further systematize the progress of materials, from the arrival of the raw materials of the factory to the finished product ready for shipment.

Guy D. Niles has been appointed manager of the Boston branch of the Portage Rubber Co. at 683 Boylston street, succeeding Judson C. Eubank. I am informed that the company has taken a ten-year lease on a new building that is being erected for its use at 700 Beacon street, but does not expect to be able to move from the present location for some months.

Charles A. Coe, Eastern selling agent of the United States Rubber Co., who has been ill at his residence at Essex Junction for a protracted period, has sufficiently recovered to be at his office in this city a portion of the week. He has hosts of friends in the trade who will be glad to hear of his recovery.

E. T. Foote, formerly of the New York office of The Cutler-Hammer Manufacturing Co., whose clutch brakes and calender controllers are used in many rubber mills, has re-

cently been put in charge of the Boston office of that company, located in the Columbian Life Building at 77 Franklin street. Mr. Foote's experience in the engineering department at the Milwaukee factory, and in sales engineering work in New York, fits him admirably for his new position.

Merton A. Turner, sales manager of the Monatiquot Rubber Works Co., South Braintree, has just returned from a most enjoyable cruise along the Maine coast in the good yacht "Hypatia." The company is laying another line of machines to take care of the increased demand for its "naturalized" rubber, and is building a garage to accommodate 12 or 15 cars.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

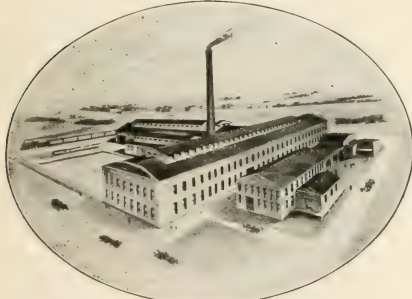
ANENT the filing of a certificate at Wilmington, Delaware, the other day, increasing the capital stock of the Globe Rubber Tire Manufacturing Co., there is unfolded a story of a marked growth in the demand for Globe tires. The stock is increased from \$400,000 to \$1,500,000 for the sole purpose of increasing the tire output of the company. The personnel of the concern will remain the same as at present.

It is the intention of the company to double their present capacity. Building operations may be begun late in the coming fall. In spite of the fact that not long ago the capacity of the

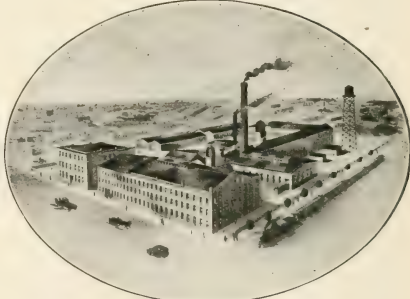
over and above its present capitalization of \$125,000 common stock, and \$50,000 preferred stock. A recently completed addition enables the company to take care of the growing business for the present, but it has been necessary to double the office room.

Contracts for a \$20,000 addition to the plant of the Luzerne Rubber Co. have been given out. This concern, which confines its operations to hard rubber specialties, has been uniformly successful since starting in business. It has been necessary each year since its organization to add somewhat to the capacity of the plant.

The North American Rubber Co., Inc., hopes to begin the manufacturing of fabric-lined tubes for automobiles next month in its newly leased quarters. Unprecedented claims are made for this tube and it is said that practical road tests have proven that it will do all that is claimed for it. By a patented process the company is enabled to line the tube with a fabric having an exceptionally high percentage of elasticity. The lining fabric is guaranteed not to crease or buckle in a tube which is only partly inflated. One of the tests to which the tube was subjected was carried out by placing it in a shoe picked from a junk heap. After the worn out shoe had been further mutilated by having a number of holes cut into it sufficiently large to cause



UNITED PLANT



GLOBE PLANT.

PLANTS OF THE UNITED & GLOBE RUBBER MANUFACTURING COS., TRENTON, NEW JERSEY

plant was materially increased, it has been a physical impossibility to keep up with orders. Both the United and the Globe plants of the companies are now working to capacity. The new plant will be erected adjacent to the present structures.

E. S. Goodloe has been added to the staff of representatives of the United and Globe companies. He will look after the mechanical rubber goods line, with headquarters at Washington, D. C. His territory will extend as far south as Atlanta, Georgia.

It was expected that the recently organized Rubber Manufacturers' Association would be located in permanent quarters by this time, but a location has not as yet been decided upon. John A. Lambert, of the Acme Rubber Manufacturing Co., president of the association, has left Trenton on a vacation of one month. After his return, action on permanent quarters may be taken.

Because of a heavy increase in its business the Essex Rubber Co. has found it necessary to increase its capital stock \$325,000

the tube to touch the ground through the tread, it was placed on a car weighing 2,800 pounds and four men entered the car. The car was driven at the rate of 45 miles an hour for nine miles without any sign of a blow-out. There were other tests equally severe. The tube is to be marketed under the name of the "Mercer."

In addition to making the tubes, the North American company will market a patented hard rubber composition for coating mandrel poles. It is claimed by the company that a mandrel covered with this composition permits the thorough and uniform curing of a tube with no possibility of burns or uneven curing, as may be the case where the metal pole touches the rubber. Mandrel poles of all descriptions can be treated with the composition and then returned to the sender for use. Another advantage claimed for the composition-covered mandrel is that it strips clean.

Representatives of the Kelly-Springfield Tire Co. have looked over factory sites in and around Trenton with a view to possibly

locating one of their plants here. Several sites have been considered and the Trenton Water Commissioner was visited by the representatives to learn whether sufficient water would be piped to certain sites in the event of their selection. They were assured that the required water would be furnished. There is no positive assurance that the company will decide to open a Trenton plant.

The Globe Tire Co. is encouraging its men in the field of athletics. A large ball park on the company's land adjoining the mill has been fenced in and bleachers erected. A grand stand is contemplated and next season the outfield is to be improved and sodded. Nearly all the rubber mills have been represented on the diamond this year, but the Globe boys have the most pretentious grounds. It is said the heads of the rubber concerns find that it pays in dollars and cents to encourage their men in activities of this sort and that there has been a corresponding falling off in saloon patronage.

William L. Doyle, who served as sales manager of the Insulated Wire Department of the John A. Roebbling's Sons Co. for many years, has resigned his position with the intention of opening a wire plant at Easton, Pennsylvania, in the near future. Robert C. DaCosta, for several years manager of the enameled wire department of the Roebbling mills, has resigned his position to become associated with Mr. Doyle in the new venture.

A permit has been issued to the John A. Roebbling's Sons Co. for the erection of an addition to their Hancock street shop, to cost \$35,000.

T. T. Tams and W. A. Bagby have arranged to handle Fisk tires in Trenton. They will also carry Delion, Eureka and Mohawk tires in their recently opened shop.

All rubber goods, in common with other commodities, used by the State of New Jersey, will after November 1 be bought by the State Purchasing Agent, Edward E. Grosscup. This is in conformity with a law passed at the last session of the Legislature.

General C. Edward Murray of the Empire Rubber Co. has been made a member of the general committee to arrange for the local reception of the delegates to the Atlantic Deeper Waterways convention on the occasion of their visit to Trenton this month.

Walter P. Austin, one of the managers at the Delion Tire and Rubber Co.'s plant, has moved his family from Washington, D. C., to Trenton.

John S. Broughton, president of the United and Globe Rubber Manufacturing Cos., recently returned from a vacation spent at Cape Cod, Massachusetts.

C. H. Oakley, president of the Essex Rubber Co., is recovering at St. Francis Hospital from an operation for appendicitis. Mr. Oakley was suddenly stricken with the trouble and an operation was at once performed. His condition was at no time serious.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

ALL of the rubber factories are running to full capacity and in many cases double shifts would be utilized if sufficient numbers of workers could be obtained. Large orders continue to be received for all kinds of rubber goods and carload lots are being shipped daily for both domestic and foreign consignment.

Several of the plants are considering the erection of additions and plans are now being drawn to provide for these improvements.

The Alice Mill of the Woonsocket Rubber Co. closed down on Friday night, August 4, for repairs and improvements and resumed on the 16th. One new boiler of the Dillon type, 18 feet by 72 inches, was installed, the other three boilers were reset and a new elevator pump was also installed.

The Millville plant of the same company was shut down for the same period. One of the most important additions to the equipment of this plant is the installation of three new electrically operated freight elevators, by the Otis Elevator Co., of Boston, Massachusetts. This is but one of a number of improvements that have been contemplated and which are now being made as rapidly as possible without interfering with the operation of the plant.

At the factory of the National India Rubber Co. at Bristol the constantly increasing business calls for large additions to the buildings and equipment and new work is being planned or carried out. The building formerly used as an auxiliary for the curing heats has recently been torn down and a new building, the same height as that of the building adjoining to the eastward, is to be erected adjoining the older structure.

The Universal Winding Co. has filed intentions, at the office of the city clerk of Cranston, to erect two new buildings at its plant. One of the buildings is to be used for foundry work in connection with the plant and is to be 220 by 161 feet. This is to be located 150 feet north of the No. 1 building and is to be constructed of brick and steel. The cost is given as \$40,000. The second building is to be 96 by 17 feet, one story in height and will cost about \$5,000.

E. C. Southwick, secretary of the foreign trade committee of the Providence Chamber of Commerce, has received a communication from a company located in Jaffa, Palestine, that desires to receive catalogs, quotations, etc., from manufacturers of certain goods including rubber goods, for early shipment at the expiration of the European war.

Officials of the Hope Webbing Co., Pawtucket, on Monday morning, August 21, unfurled two large flags over their office buildings in that city, one a national flag and the other a state flag. In speaking of the occasion, General Manager Charles S. Sisson said that it was an innovation among industrial plants and that the object was to indicate the company's loyalty to both the country and the State.

The Phillips Insulated Wire Works, at Pawtucket, closed down on August 10 for an indefinite period. Numerous strikes have been called at the plant during the past few months.

Walter Norton, assistant superintendent of the United States Rubber Co.'s plant at Lycoming, Pennsylvania, who has been making a trip through New England visiting the various plants of the United States Co., was an interested visitor at the factories of the Woonsocket Rubber Co. at Woonsocket and Millville and of the National Rubber Co. at Bristol.

John Conrick, for several years in the office of the National India Rubber Co., Bristol, has resigned to accept a similar position with the Lee Rubber Tire Co., of Conshohocken, Pennsylvania.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

AS far as government orders are concerned business remains brisk, in mechanical, but has fallen off in proofed goods, with the result that solvent naphtha is obtainable at much more reasonable prices than prevailed a year ago. Side lights on the importance of various processes and departments are reflected from time to time in the application made to the tribunals for exemptions. A successful application was made the other day for the manager of a new rubber reclaiming factory on the ground that he was engaged in urgent work for the government. This sounds rather odd to those of us who have long been familiar with the clause in government specifications for rubber goods, notifying that no crumb rubber, reclaimed rubber, or rubber substitute may be used. Possibly this restriction may not be enforced at the present time, for some classes of goods at least. If this surmise is correct, it will be a source of gratification to manufacturers of high-grade alkali reclaim, who have long held that the clause should be deleted. In mentioning government orders, it must be noted that such do not refer to the British Government only, but to the Allies as well, and it may be that the specifications of different countries show variations. I may mention that the analytical tests which government rubber has to stand preclude the use of organic matter such as oils, and, therefore, it may be considered redundant to mention that they are ruled out. Thus the usual stipulation at the present time is "the rubber of the mixture must not yield more than 10 per cent of organic acetone extract, and not more than 10 per cent of organic alcoholic potash extract after removal of acetone extract." I may amplify this reference to reclaimed rubber by mentioning that two new works have recently been started, thus testifying to the good condition of the trade. Later on I hope to say more about these ventures.

SOME PENDING LEGISLATION.

One or two matters concerning politics are not without interest to rubber manufacturers at present. One is the bill which has already passed the House of Lords, which is to compel companies and firms or individuals trading under assumed names, to register the correct names of the partners. Thus the X. Y. Z. Rubber Co., makers of certain rubber goods, will have to register the names of the proprietors for public inspection. A bill to this end was brought in some years ago, but failed to pass. The favorable reception given to the present bill is due to the desire of traders to know whether firms with British titles are owned or not by those who at the moment are enemy aliens.

Turning to another matter, it is common knowledge that many British tire manufacturers have been keen on the stoppage of the imports of American tires, but for certain reasons the government has taken no action in the matter. The importation of other classes of goods, for instance, soap, has, however, been stopped, but there is by no means unanimous opinion among manufacturers that if such war time measures are perpetuated it would be to their ultimate advantage. A manufacturer said to me recently: "I would rather have American competition from over the water than have the Americans coming over here and putting up works next door to mine, which they probably would do."

With regard to pneumatic tires, it was reported that the Ford company was making preparations to produce its own tires and had taken extra land in Trafford Park, Manchester, for the purpose. This was when, in a previous budget, it was proposed to put an import tax on tires. As this proposal did not mature, the idea seems to have been abandoned; at any rate, for the present.

CRUDE RUBBER PRICES.

The price continues to favor buyer rather than seller, though the general opinion seems to be that if the commodity goes any lower it will only be to a trifling extent. Cautious but steady buying for future needs has been the rule lately, though I do not think that much credence may be attached to the somewhat sensational story that one of our largest works has bought very largely at 1s. 7d. per pound for future delivery. Fine hard keeps up its premium over plantation, the supply being somewhat less than a year ago, and there are the usual buyers who want this quality and will not look at anything else. It was noticeable at a recent auction that fine hard rose $\frac{3}{4}$ penny per pound while at the same time plantation fell $\frac{1}{2}$ penny. I understand that the slow American demand is to be attributed in part at any rate to the election. On this side we don't let elections interfere with business, but there is probably a difference in the election.

As to the future the opinion is widely held that there will be no more 3 shilling plantation, until peace comes and with it the German demand, which will, of course, be a large one.

CHEMICAL SOCIETY MEETING.

Among the large number of papers which were read and discussions which took place at the annual meeting of the Society of Chemical Industry, held this year in July, at Edinburgh, rubber was not mentioned at all, nor were any of the rubber manufacturers who are members present. In connection with the meeting there was an exhibition of dyes, various fine chemicals, and glass and porcelain laboratory apparatus produced for the first time in Britain and previously obtained from enemy countries. The North British Rubber Co. showed a large variety of erasing rubber goods, which though of course by no means new to British trade, have been imported largely, in the past, from Central Europe. An interesting exhibit was the blue oxide of cobalt made for the first time in Britain by the Beaverhall Colour Co., of Edinburgh, the source being Canadian cobalt ore. The exhibit of the Broxburn Oil Co., Limited, D. R. Stewart's paper on the Shale Oil Industry and the visit of the members to the works of the Pumpherston Oil Co. at Midcalder had associated interests with the rubber trade. This industry, like many others, has benefited by the war. For one thing, since the rise in the price of coal tar naphtha, the shale spirit, which has always been used to a limited extent, has been in greatly increased demand by Scotch proofers, and has probably gone over the border. In the course of a paper on recent developments in coke oven practice it was stated that at one place the waste gases were being burned under iron plates for the production of lamp black. The process was kept a secret and the reader of the paper knew nothing of the quality of the black. This development is of importance because of the scarcity and high price of American carbon black at the present time. One of the speakers said with regard to the utilization of the present glut of coal tar pitch, that the efforts which had been made to convert it into natural asphalt, or at any rate, to a body with the physical characteristics of the latter, had not been crowned with success.

Papers which were read in reference to the manufacture of fine chemicals and medicinal chemicals testified to the great progress which has been made in these branches in the last two years, a branch of manufacture in which Britain has always been backward. This should mean an increased demand for vulcanite and gutta percha, which are used to a much larger extent than in the heavy chemical manufactures. At the close of the meet-

ing a large party of the members visited the works of the North British Rubber Co. and were shown over a considerable portion of this hive of industry, including the new chemical laboratories, where the special apparatus for testing balloon fabrics for permeability to hydrogen was an interesting feature. The new buildings for the solid tire department are nearly finished, the machinery having been delivered. The party was under the efficient leadership of Mr. Porritt, chief chemist, and Mr. Luff, assistant.

PETROL RESTRICTIONS AND THE TIRE DEMAND.

The large and increasing demand of the service for petrol has resulted in civil consumers being limited to certain quantities, which has naturally had the effect of reducing motor traffic, especially long distance pleasure motoring. A resultant effect must be a reduction of business for the tire manufacture, though to what extent it is difficult to say. At this stage, at any rate, it is difficult to find anyone who cares to make a prediction. Already, however, in the West End of London, the discarded victoria and other horse-drawn vehicles have reappeared, and I have been told in the country that horse carriages would be brought out again generally, if there were not a shortage of horses. The push cycle is also being seen in increased numbers, so we may expect a run on carriage, cab and cycle tires this autumn. A wealthy owner of a Ford car with Goodrich tires told me that he had now got level with the owners of heavy expensive cars who used to chaff him, as he could cover a much larger mileage on his allowance of petrol than they could, and nowadays this is the main thing that counts.

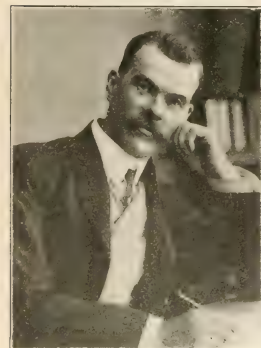
COMING TO ENGLAND.

Hugh Fraser Macmillan, who recently left Ceylon on a well-earned leave of absence, completed last June, 21 years in the Ceylon Government service.

During that time he filled the post of curator of the Royal Botanic Gardens, Peradeniya, and has acted periodically as superintendent of the Hakgala Gardens during the absence of William Nock, now retired.

With the reorganization of the Peradeniya staff under the scheme for an Agricultural Department formulated by R. N. Lyne, the Director of Agriculture, Mr. Macmillan was appointed superintendent of Botanic Gardens in Ceylon with a curator to assist him at Peradeniya.

During his 21 years' service in the East Mr. Macmillan has made a thorough study of the flora of the Eastern tropics, in which he was aided by his knowl-



edge of the vernacular languages acquired soon after his arrival in the Island; and as the fruits of his experience he has produced his "Handbook of Tropical Gardening and Planting," which has become a standard work of reference.

A photographer of no mean order, Mr. Macmillan's studies of plant life are in great request both for local and foreign publications.

In addition to his regular duties Mr. Macmillan is lecturer

on Economic Products at the School of Tropical Agriculture. He is the author of an excellent illustrated guide to the Peradeniya Gardens, and has written numerous bulletins for the Department of Agriculture, papers for the Agricultural Society and articles for the "Tropical Agriculturist."

The Peradeniya Gardens of to-day owe much of their beauty and attraction to his trained and artistic eye which has also brought him into prominence at the agricultural shows. He was Secretary of the All Ceylon Exhibition of 1912 and in recognition of his services in this capacity he was presented with a special gold medal. He has a host of friends who will welcome him on his arrival in England.

INVENTOR OF MURAC INSOLVENT.

A meeting of the creditors of Morland Micholl Dessau, inventor of "Murac," was held last month at the offices of the official receiver for the Brentford district. Mr. Dessau at this hearing stated that he is an American subject and came to this country in 1893 with a free capital of about £5,000. In 1906 he invented a process for the manufacture of "Murac," to improve low-grade rubber. This invention was assigned to the Murac Syndicate, Limited, which was succeeded by the British Murac Syndicate, Limited, the inventor receiving shares in the company and being appointed technical adviser at a salary of £700 a year, and commissions which amounted to £200 a year. He also invented a machine for washing rubber on which he received one-half the profits, but the business and patents were afterwards sold to the Crude Rubber Washing Co., Limited. The business of this latter company was not successful and the inventor found himself indebted to the London Venture Corporation which had promoted the Crude Rubber Washing company. Although since then he has invented a rubber-capped wooden block intended for use in paving highways, an expanding joint for guttering highways, and a rubber skate, the exploiting of these has been unsuccessful on account of the present war conditions. For the last year he has been employed as a buyer for the Associated Rubber Manufacturers. He has lost on the Stock Exchange and in the raw rubber market, to an estimated amount of £30,000, but it was not until this action was taken by his creditors that he discovered himself insolvent. The official receiver postponed the meeting, intimating that a proposal of composition for the benefit of his creditors should be made, which must not be less than 5s. on the pound.

RECLAIMED RUBBER

I have found a trade circular over thirty years old in my rubber archives, which emanates from Loewenthal & Morgenstein of New York and is headed "Rubber Shoddy for galoshes, clothing, hose buffers, insulated wire, and all other kinds of rubber work. Works: Cresskill Rubber Works, Cresskill, N. J." The circular explains that the shoddy is made of old rubber boots and shoes by a mechanical process by which they are finely pulverized and the fibre and other deleterious matter removed, leaving a fine vulcanized rubber powder. Two grades of this powder were made, and it was offered to the rubber trade in this state, with instructions for devulcanization. The process is summarized as follows:

"The powder is put into iron pans about 2 feet deep which are placed in a steam vulcan pan with live steam and covered to prevent condensation of water on the rubber. The heat is kept at 300 F. for 25 hours, after which the rubber is ground on mixing rolls until it will produce even sheets, which occupies twenty to thirty minutes, the rolls being kept at the temperature required for working low grade crude rubber." It is stated that "some manufacturers use 50 per cent of this shoddy for galoshes and from 10 to 75 per cent for belting, packing and mats, but practical experiments are advised in order to determine the quantity which is suitable."

In addition to selling the original shoddy powder to manufacturers the Cresskill Rubber Works also devulcanized it them-

selves and sold the powder in the devulcanized form. This circular evidently relates to the beginning of the now large and important reclaimed rubber industry, and it would be interesting to know whether a satisfactory sheet was really obtained without the addition of mineral oil or other binding matter, as is customary in the mechanical process of today. Perhaps some of our manufacturers who received this circular between 30 and 35 years ago and responded to it might be disposed to relate their experiences. The reference to the extensive use of the substance for rubber belting synchronizes rather ominously with the date given in a preceding paragraph for the deterioration of rubber belting.

BRIEF NOTES OF INTEREST.

The authorities here have discovered that hundreds of rubber covered typewriter cylinders have been shipped by small London firms to neutral countries. Believing that Germany was probably their ultimate destination, many parcels have been seized, and it is anticipated that prosecutions will be instituted under the Customs Exportation Prohibition Acts and the Orders in Council.

The Trading with the Enemy Amendment Act, 1916, has been applied to the property of the Bakelite Co., Limited, Orb Works, Cowley, Middlesex, for which a controller has been appointed.

Owing to extended increase in its solid tire business in Scotland, the W. T. Henley's Telegraph Works Co., Limited, London, has opened a depot adjacent to its Glasgow branch where a hydraulic press is maintained for fitting and removing solid rubber truck tires.

Announcement has been received from Richard Julius Hoffmann, 139 Cannon street, London, E. C., to the effect that he has changed his name by legal process to Richard Julius Arnold.

RUSSIAN RUBBER COMPANY PROFITS.

A general annual meeting of shareholders of the Russian-American India-Rubber Co., "Treugolnik" was held in Petrograd on March 31 (April 13) last. Accounts for the year 1915 were submitted and approved.

The net profits amounted to 12,845,212 rubles [\$6,615,284] and the dividend to be paid was fixed at 35 rubles [\$18] per share.

The board of directors was authorized to add 9,000,000 rubles [\$4,635,000] to the capital of the company for the purpose of extending its business and handling large orders obtained from the Russian Government.

Aside from its nominal value of 100 rubles [\$51.50], each new share will include a premium equal to the part of each old share in the company's reserve fund. To facilitate the realization of this new issue of shares, the directors were authorized to draw from the special reserve fund—which is at the disposal of the shareholders—a sum of 5,670,000 rubles [\$2,920,050] to pay up, at the rate of 63 rubles [\$32.44] per share, a portion of the premium on the new shares, so that the shareholders would have to pay cash only for the balance of the premium due, plus the nominal value of the shares.

Another annual meeting of shareholders of a rubber manufacturing company recently held in Petrograd, was that of the "Bogatyr" Mechanical Rubber Co. The capital of this company is 9,300,000 rubles [\$4,830,700] and the profits for the year 1915 amounted to 2,674,261 rubles [\$1,377,244]. A 9 per cent dividend was declared.

AUTOMOBILE TIRES IN SWEDEN.

A large demand is reported to exist in Sweden for American automobile tires; there being practically no others on the local market.

As the Entente Allies are allowing to pass their blockade, only the same number of tires as were imported by Sweden in the 12

months preceding the war, very few American tires are getting into that country. Most American cars imported come in with-out tires and the stocks of tires that are in the country are mostly held by speculators.

It is stated that recently a dealer in a low-priced American car was obliged to pay as high as \$300 a set for tires for a car selling in the United States at slightly more than \$400 fully equipped.

THE SITUATION IN FRANCE.

By Our Regular Correspondent.

FIGHTING here has increased a hundredfold since I last wrote you. To the vigorous defensive of the Verdun sector our armies, together with those of our Allies, have added a gigantic offensive movement on the Somme front, where rubber-tired automobiles and motor trucks are, like at Verdun, playing a leading part. Probably a hundred thousand are engaged in transport and staff work, and these are consuming about four times as many solid and pneumatic tires as an equal number of machines would wear out under normal conditions in private use.

In spite of this tremendous demand our rubber manufacturers are giving full satisfaction.

DISTRIBUTION OF TIRES.

In the early days of the war there was great lack of organization in the distribution and the repairing of tires, with the result that the wastage was terrific. The suddenness and the extent of the effort necessary to stem the tide of invasion was such that tire economy was considered a matter of no importance. Drivers of cars using pneumatic tires, having neither time nor means of effecting repairs, abandoned damaged tubes and casings by the roadside, and their claims for new ones were never questioned. All this has been corrected. Now each and every car and driver works from a base or depot, into which every worn



RUBBER TIRES RECEIVED FROM THE FRONT.

or damaged tire casing or tube has to be returned before new ones are allowed. From the depot the damaged tires are sent to central repair stations, where they enter a well-equipped shop and are, when possible, made almost as good as new. Repaired tubes are tested, dried, talced and packed in cardboard boxes marked with their dimensions, makes and other necessary indications. Repaired casings are wrapped and marked just as for new ones. These repaired tires are stored in special warehouses and distributed, several hundred a day, to the army machines as needed.

SOLID TIRES.

Similar methods are employed for solid rubber tires. Travelling hydraulic presses, like the one I described and of which I sent you a photograph in a previous letter, are carried on trailers hitched to motor repair trucks. The solid tire depots are also provided with large hydraulic presses. All important solid rubber

tires are returned to the depots of the respective army sectors, special machines pare off the rubber remaining on the steel bases, and the latter, together with the scrap rubber, are sold from time to time, as quantities accumulate, to tire manufacturers and rubber reclaimers, so that, all in all, waste is reduced to a minimum.

TWIN TIRES.

I note that the subject of twin or dual pneumatic tires—which is by no means new here—is attracting much attention in American automobile circles.

Dually mounted pneumatic tires have been used here in France for more than four years, and their use has greatly increased since the outbreak of the war.

Prior to the war twin tires were never recommended for light weight automobiles, being only of advantage on cars in which the weight to be borne by each of the rear wheels was in excess of 1,500 pounds per wheel, practically the limit weight that can be borne, without excessive strain, by current sized pneumatic tires. On such cars it was found that the use of these dual tires was of decided advantage. They required less air pressure per tire than single tires carrying an equal weight and they gave better mileage results.

Under war conditions the use of twin pneumatic tires has greatly increased, especially for ambulance work, and more because of the increased security they afford—one tire can be punctured without necessitating a stop for changing. Further, twin fittings allow the use of repaired casings and tubes that would never stand the strain were they mounted singly.

The objection to dual tires is that they increase the traction effort necessary to move the cars, therefore require more gasoline, and have the bad habit of picking up rocks and throwing them with no small force.

TIRES IN PRIVATE USE.

We are so much absorbed by the war that I have, up to date, failed to mention the fact that very large numbers of private cars have been kept in commission in spite of the war and that these consume considerable quantities of tires. This private demand for tires has also been largely taken care of by our domestic rubber manufacturers.

LEATHER TREADS.

Our tire manufacturers have largely, not to say completely, discarded the leather tread metal-studded anti-skid tires which have so long been in almost universal use in Continental Europe. They have continued to make metal-studded casings, but the studs are now embedded in the rubber tread and in the fabric of the tire, instead of being anchored in a leather cover.

It will be remembered that leather treads were made of chrome-tanned cowhide and required leather taken from the middle of the back of the animal. Chrome tanning made the leather impervious to water and prevented it from softening when wet.

Many attempts had previously been made to launch metal-studded rubber tread tires on the market but these had always failed, chiefly on account of lack of durability, which was due to faulty methods of tire building. The scarcity and consequent high cost of leather has led to great improvements in the making of these rubber tread, metal-studded casings, but it has not as yet been proven that this type will show itself to be equal, let alone superior, to the time-honored leather non-skids.

RUBBER IMPORTS AND EXPORTS DURING 1915.

Statistics for the year 1915 have been recently published. Although the individual items of these statistics are not as well defined as in normal times it is probable that those for rubber represent more imports of rubber and rubberized clothing, footwear, etc., than tires. It is, of course, true that in the first year of the war large quantities of rubber tires were imported, especially solid tires for American motor trucks, which came into this country in great numbers.

The imports of manufactured rubber in 1915 amounted to \$4,928,000, as against \$4,970,000 the previous year.

Exports of rubber goods, largely tires, amounted to \$13,958,725 in 1915, as compared with \$16,395,350 during 1914.

SALES OF AMERICAN CHEWING GUM.

An interesting development of the war times, though not exactly a rubber item, is worthy of mention.

American chewing gum has long been sold in Paris and other centers, but almost exclusively to American visitors, for whose convenience it was stocked by druggists patronized by them. Since the outbreak of the war chewing gum has become popular with native consumers, and it is now being sold in many parts of the country, not only by druggists, but also by tobaccoists and other retail dealers. The gum is presented in American style, but with French labels, and it is retailed at relatively the same prices as in the United States.

THE CHEMICAL INDUSTRY.

I have repeatedly mentioned to you the scarcity of chemicals for the rubber industry and the necessity of importing much of these from abroad.

Conditions in our chemical industry have greatly improved. War orders and the absence of German competition have made this a really profitable industry, and it has developed to a remarkable degree. The manufacture of chemicals, materials for explosives, medicines, antiseptic preparations or the treatment of wounds, etc., has been developed along with the manufacture of benzene, benzol, toluene and the like, and acids and coal tar products, which were formerly imported from Germany, are now being produced in excellent quality in France.

Our rubber manufacturers are still importing many chemicals and compounding ingredients, but the energy and skill of our chemical manufacturers is achieving success and it will not be long before almost all our requirements will be produced by domestic manufacturers.

SECOND SAMPLE FAIR AT LYON.

Beginning March 1, 1917, and continuing for 15 days, the Second Annual Lyon Sample Fair will occupy the attention of the commercial world. The first fair was opened on March 1, 1916, and although there was scarce time to work out the details of such a great undertaking, it proved, nevertheless, to be an immediate success and gave promise of accomplishing its original purpose of establishing a sample fair in France similar to the great Leipzig Fair held in Germany.

At the last Lyon Sample Fair, it will be remembered, rubber companies of France, England, Spain and Italy were well represented and all reported unexpectedly large sales.

American rubber concerns should take advantage of this opportunity to present their products to French buyers. The total sales made in all merchandise from samples at the last fair exceeded \$30,000,000.

TRADE NOTES.

A severe fire resulting from a short circuit recently caused damages estimated at more than \$60,000 to the rubber factory operated at Billancourt, near Paris, by Arthur Gobert, manufacturer of friction tape, rubber solutions, and reclaimed rubber.

The Société Générale des Établissements Bergougnan, Clermont-Ferrand, well-known manufacturer of rubber tires and general rubber goods, has issued 16,250 new shares of 500 francs [\$96.50] each, completely paid up by the reserve fund of the company. This reserve fund amounts to 10,000,000 francs [\$1,193,000] and is wholly made up of funds derived from premiums paid by subscribers on shares previously issued to increase the company's capital. These new shares are to be distributed

among shareholders at the rate of one new share for two old shares, taking part in the profits earned from October 1, 1915, on. The Bergougnan company's profits for the fiscal year 1913-1914 amounted to 6,746,445 francs [\$1,303,004].

At a meeting recently held by the shareholders of the Société des Établissements Hutchinson, tire and rubber manufacturers, a dividend of 30 francs [\$5.79] per share was declared for the year 1915 on preferred shares, while a 40-franc dividend [\$7.72] will be paid on common shares. In 1914 the common shares only received 25 francs [\$4.82] per share. The total profits of the company in 1915 amounted to 2,531,525 francs [\$488,525] of which a large amount was written off to the reserve fund.

Rubber Planting Notes.

FUNGUS OF RUBBER IN MALAYA.

IN the last two years the fungus *Ustilina Zenata* has attained prominence in the Federated Malay States as the cause of a root disease affecting rubber trees over ten years old.

This root disease was first noted early in 1913 by E. Sharples, mycologist of the Agricultural Department of the Federated Malay States, but it was 12 months later that the fungus was isolated in pure culture and the fruit bodies found. Evidence obtained during the last year indicates that the fungus has been causing damage for several years. A manager of a rubber estate in Johore reports that he has been losing trees, owing to its attacks, since 1907.

This same fungus is the cause of a common root disease of tea in Ceylon, though it is not yet certain that it attacks *Hevea* in that country.

In Malaya, the fungus is found on old plantations in every part of the peninsula. It attacks old rubber trees, especially in the region of the Collar; only in advanced cases does the fungus spread up the stem and it seldom reaches two feet above the soil level. The diseased wood, on exposure, is found to be dry and tindery, and, running through the diseased tissues, conspicuous black lines are to be seen.

Fungus appears to be one of the chief agents causing the rotting of rubber stumps and logs left in plantations after thinning out operations. It enters the stumps and grows down them into the lateral roots. The roots of growing trees in contact with these infected laterals are quickly attacked.

Remedial measures against this root disease consist of thorough cleaning of timber and jungle stumps when clearing, and of rubber stumps and logs at the time of thinning-out. Strict sanitation methods, thorough clearing, attention to wounds, etc., should be strongly advocated lest fungoid diseases impair the future of the rubber planting industry.

CRUDE RUBBER INDUSTRY IN PERAK.

According to the annual report for 1915 by the British Resident in Perak, Federated Malay States, the quantity of crude rubber exported during the year was 16,663 tons as against 11,041 tons in 1914, an increase of 5,622 tons.

The acreage in rubber alone of estates exceeding 100 acres in area was 164,022 acres, with 2,226 acres in addition interplanted with catchcrops; of this area 2,195 acres was planted in the year under review. The crop for this total area was given as 12,112 tons.

RUBBER IN SELANGOR.

The annual report for 1915 by the British Resident at Selangor, Federated Malay States, recently published, contains some interesting details concerning the rubber planting industry in that state.

The approximate area under rubber was 255,326 acres. In some estates in the Klang district where rubber was interplanted

FRENCH GOVERNMENT SPECIFICATIONS FOR RUBBER MASKS.

The French Government specifies the following composition and tests for the rubber employed in the manufacture of army masks:

New rubber, not less than 50 per cent. Sulphur of vulcanization, not to exceed 5 per cent of the rubber present. Free sulphur, not over 1 per cent. Mineral residue (ash), not over 35 per cent. Moisture, not over 3 per cent. Reclaimed rubber and substitutes, none. Minimum thickness, 1 millimeter [.03937 inch.]

The rubber must withstand a tensile strain of 250 grams per square millimeter without breaking, and be able to stretch at least 225 per cent.

with cocoanut trees, the latter were cut out in order to allow the rubber trees to develop. In many small holdings, also, cocoanut trees in good bearing have been cut out in order that rubber may be planted. This practice on the part of small owners is condemned by the Director of Agriculture, Federated Malay States, who advises that it be discouraged as far as possible.

About the middle of the year a demand suddenly sprang up among small cultivators for the seed of what was known as "getah chat," a species of rubber which was said to grow faster and give better return than *Hevea*. The origin of the report had not been discovered, but inquiry proved that the tree in question was identical with the *Ceara* rubber tree, and steps were taken to warn cultivators of its low economic value as a rubber producer.

CRUDE RUBBER EXPORTS FROM THE GOLD COAST COLONY.

According to a report of the Comptroller of Customs at Accra, British Gold Coast Colony, the value of the total exports of crude rubber from that colony during the year 1915 amounted to £25,167 [\$122,475], as compared with £21,631 [\$105,267] in 1914; showing an increase of \$17,208.

RUBBER TRADE OF JAVA AND SUMATRA.

According to a recent report of the American Consul at Batavia, Java, the United States bought 7,486,080 pounds of plantation rubber from Java in 1915 and maintained for the whole year its rank as the island's best customer, which it had won in the January-June half of the same year. Great Britain was second with purchases of 4,818,240 pounds, and the Netherlands third with 2,885,120 pounds. The total for the year was 96 per cent larger than for 1914, amounting to a total of 16,705,920 pounds, as compared with 8,581,440 pounds in 1914.

The Dominion of New Zealand has placed an export embargo on crude and manufactured rubber.

RUBBER SAMPLES FROM NORTHERN NIGERIA.

The Imperial Institute, London, England, has recently published the results of tests made on a sample of rubber produced in Northern Nigeria.

The sample lost 26 per cent. of its weight in washing (due to the large amount of impurities). The analysis of the residue showed:

Caoutchouc	49.2 per cent.
Resin	47.7 per cent.
Proteins	2.4 per cent.
Ash	0.7 per cent.

The caoutchouc that was separated was almost black and its physical properties were poor. From the analysis the investigators concluded that the sample probably came from the *Ficus vogelii*. Samples of rubber produced from the latex of *Ficus vogelii* growing in Gambia and on the Gold Coast had previously been tested at the Imperial Institute.

THE RUBBER TRADE IN MALAYA.

By Our Regular Correspondent.

THE annual meetings of many of the rubber estate companies of the Malay Peninsula have been coming thick and fast in the last two months, and to those connected with the industry a comparison of the reports for 1915 is of interest. Though companies may differ widely in degree, some owning new estates which are just beginning to feel their feet, and others being old established concerns—as old established goes in the Eastern rubber trade—one dominant fact stands out in all the reports; that is, 1915 was a good year. Among most of the companies which have reached the paying stage, a dividend of less than 10 per cent for the year is exceptional. In the gilt-edged varieties we find figures calculated to take away the breath of those who are not acquainted with rubber's paying properties. There are companies which have paid 160 per cent and more for the year, and cent per cent is not by any means uncommon. Those outside the magic circle can only vaguely imagine what it feels like to get one's investment, and more, returned annually.

As perhaps the majority of the companies are registered in England, and the bulk of the shareholders reside there, a matter of immediate concern to directors at the present time is that of excess profits taxation. Just now, no one seems to have any definite idea as to what rubber companies will be called upon to pay in this direction, and all that can be done is to carry forward substantial sums to cover any possible demands. Naturally a Chancellor of the Exchequer, with war expenditure to provide for, is likely to keep a sharp eye on companies which pay big dividends. While the most prosperous companies feel that they cannot reasonably object to whatever calls are made, many of the newer ones feel that they have a legitimate grievance in one respect. Estates may have reached a paying basis only since the war began, and shareholders feel that not only is it impossible to attribute their profits to the fact that war is being waged, but that profits would probably have been a great deal bigger if there had been no war. But these are questions which have still to be decided, and, as I have said, all that companies can do at present is to retain an ample reserve.

The matter of forward contracts is also prominent in most reports. As is generally known, forward contracts have become a feature of the rubber business of late years, for when the last echoes of the boom of 1910 had died away, and the price began on a steady downward course, many companies became anxious regarding the policy of selling from month to month, and would agree to sell so much of the monthly output at a fixed price for, say, one year. The days when a price of four shillings a pound was not at all unlikely seemed gone forever. A two-shilling period appeared to have set in, so it was thought better to sell at, say, a fixed 2s. 4d. for the year than to fluctuate from 1s. 10d. to 2s. 8d. These figures are, of course, merely approximate. Naturally a forward contract policy cuts both ways, and in 1915 the cut happened to be against the seller. In the last six months of the year there was a sharp rise in prices, and companies which had contracted to sell so much of their output at 2s. 5d. a pound bemoaned the fact that in the absence of forward contracts they could have got an easy 2s. 11d. However, directors console themselves with the reflection that the forward contract policy seemed best when the year began, and they could not be expected to foresee what the last few months would bring to light.

A point in reports which those concerned with the manufacturing side of the business will note with pleasure, is that it is now quite the rule for companies to earmark a certain portion of their output, to be used in the scheme for investigating new uses of rubber. It is generally admitted nowadays that the methods of employing rubber are only beginning to be discovered, and with the export from Malaya increasing practically

month by month, it is easy to see that this is a point which concerns the producer as much as the manufacturer. That companies owning estates realize this is now quite evident, and with the money and produce which is being set aside for the purpose, one hopes to hear of a big step forward in the development of the product's usefulness.

As regards the increasing output from Malaya, a passage from the last report of the Colonial Secretary of the Straits Settlements is of interest. Here it is said that rice cultivation, formerly the staple industry of the Straits Settlements and the Federated Malay States, is fast disappearing. The Malay who owns a few rubber trees can live in comfort, have silks for himself and his family, and buy all the imported rice he wants—a decided contrast to the lot of the rice cultivator, who has to cultivate with all his might, in order to support a bare existence. Demands for rubber plantations are increasing enormously, and where possible, as regards small native holders, the government lets them out with the proviso that trees are grown in conjunction with the cultivation of more homely products. Meanwhile, rice fields are allowed to lie fallow so that cultivation can be taken up again at once if necessity arises.

The following figures, which are those for the first quarter of the present year, show the increase in the export of rubber from Malaya down to the present time.

	1914.	1915.	1916.
January	2,542	3,473	4,471
February	2,364	3,411	5,207
March	2,418	3,418	4,429
Totals	7,324	10,302	14,107

PECULIAR METHOD OF GATHERING RUBBER IN SIERRA LEONE.

A CURIOUS and interesting method of collecting *Funtumia elastica* rubber in Sierra Leone is described in a book recently written by O. H. Newland, director of the Peneiro Rubber Estates, Limited.

The natives fell the tree and cover it with dry grass, which is set on fire. The heat generated is just sufficient to cause a practical coagulation of the latex in the lactiferous vessels. The bark is then bruised off by pounding with stones, and the debris taken down to the river and washed thoroughly to separate the bark from the rubber. The separation is seldom complete, and the result is a dirty rubber, fetching 2s. [48 cents] per pound.

This primitive method, however, is not universal in Sierra Leone. The more intelligent natives ascend the trunk of the standing tree by means of a sling passed around the trunk. One end of the sling is provided with a loop which fits over the right thigh. The worker keeps his left foot on the sling and thus, by moving the rope up the tree the ascent is rapidly accomplished and when the desired point is reached, both hands are free to make the tapping.

The climber carries a chisel with which he cuts vertical as well as transverse oblique grooves, forming a rough "herring bone" pattern, which may be continued the whole length of the trunk, and even extend up to the main branches. The flow of latex commences at once, and follows the vertical channel into a calabash placed at the base of the tree, being guided by means of a lip of clay or a chip of wood. The quantity of latex procured at one tapping varies from a pint to two quarts per tree. After each tapping the tree is allowed to rest several months, during which the wounds heal. On the second tapping the same form of cut is made upon the opposite side of the tree, and the transverse channels often intersect those made previously.

In gathering the vine rubber of the *Landolphia ovariensis*, the natives add lime juice to hasten coagulation when it is necessary to do so. Usually, however, the *Landolphia* latex coagulates in the tapping wound almost immediately upon exposure

to the air. Oftimes the collector merely smears the fresh latex upon his naked body, until enough has been coagulated to be stripped off and formed into a small ball, which serves as a nucleus for winding on the strips of fresh latex, as the new cuts are made.

THE RUBBER TRADE IN DUTCH GUIANA.

By Our Regular Correspondent

THE report on the leaf disease prevailing in the colony made by the Agricultural Department has not yet been published, although it is said to be completed. The matter has been treated at length and should furnish interesting reading.

In the neighboring colony of British Guiana Mr. Bancroft mentions in his report on the South American Leaf Disease the following improved methods of treating the disorder:

"Six pounds of copper sulphate are dissolved in five gallons of water in a wooden vessel. Then four pounds of lime are slaked in a little water and put in a tub with 45 gallons of water; it is stirred well and allowed to settle. After it has settled the clear supernatant lime water is poured off and mixed with the copper solution, the whole being thoroughly stirred for at least five minutes. Care must be taken to determine that all the copper has been precipitated and this can be done in the usual way by testing the mixture with a clean, bright blade of a knife. If copper is found deposited on the knife blade, then there is copper in the solution and more lime water is to be added." It is claimed that this method insures a mixture which will act more quickly than the old method, and also that the fungicide is more effective.

The quickness of action is of great importance in dealing with many fungoid attacks, especially so in the case of the present leaf fungus attacking rubber plantations. What treatment will be recommended here in Dutch Guiana is hard to tell, but as far as can be gathered, a treatment of spraying will be instituted.

On the government rubber plantation "Slooywijk" the disease is rampant, and measures have been taken to cut down the trees and plant in their stead coffee, which, in the government's opinion will be more remunerative in the near future.

On other plantations in the colony, the disease does not appear to have such disastrous results, and hopes are entertained for an eventual speedy recovery.

RUBBER TAPPING UNREMNERATIVE AT PRESENT.

Tapping operations have been carried out on only a few estates during the past six months, owing especially to the want of lucrative markets, but, it is said, as soon as the war is over, a general tapping campaign will be commenced, when it is anticipated an increase in the price will follow.

BALATA PRODUCTION LARGE.

The balata industry is showing signs of vigorous health, and several thousand bleeders are engaged in gathering this season's harvest, which is expected to be large. Several parcels are arriving daily from the interior and if weather conditions remain as satisfactory as at present, the production will be a large one. Government figures show the production from January to June, 1916, 234,840 kilos [517,728 pounds]; January to June, 1915, 74,222 kilos [163,630 pounds]. The bulk of the product is yet to arrive, August and September being the greatest productive periods.

BLEEDERS EMIGRATING TO FRENCH GUIANA.

One of the principal collectors has transferred his office to French Guiana, where he has joined company with a wealthy French combination and is said to be reaping a big harvest. Many of the bleeders employed at Cayenne are old seasoned Surinam men who left the colony when the new regulations were instituted here. They find French conditions much better and can earn more money.

French Guiana promises to become a most important balata center, and already reports are going the rounds that in 1917

most of the best bleeders from this colony will join their friends in the new fields at Cayenne.

DRAINAGE AND IRRIGATION NEEDED.

The recent heavy rains which have caused flooding in many districts where agricultural pursuits are carried on, again brings forward a question which has been raised more than once in the local press, viz., the possibility of a new Department of Irrigation and Drainage being formed.

It is well known that on drainage and irrigation hang most of the agricultural problems of this colony. It is certainly worth while getting to the root of the matter, for with good drainage and irrigation, even the most backward farmer is fairly certain to earn a competency.

When one considers the enormous advantage to be gained by the colony if the best and highest returns are obtained to the acre of cultivated land, it seems lamentable that no more effort has been made than has actually been the case.

OTHER AGRICULTURAL REFORMS NEEDED.

It would be far wiser for us to face, not only this question of drainage and irrigation, but also the question of building up a solid, thriving peasantry, the establishment of agricultural schools not confined to one district, the creation of a more elaborate system of school gardens, and a carefully devised and extensive scheme of field instruction. In other words we must face our agricultural problems and be prepared to spend more money on schemes which are bound, if properly conducted, to prove sound investments. One has but to look at the money voted for the Agricultural Department to be assured that it is impossible for those responsible for the agricultural progress of the colony to accomplish very much. No, we have to face the position. If we are to do work of a permanent nature we must find the money to do it with. Other problems of even less importance have, in the past, received sufficient money to carry them through. Why not agricultural problems?

RUBBER AND BALATA INDUSTRY IN NORTHWEST BRITISH GUIANA.

According to an official report on the industrial conditions in the Northwest District of British Guiana and covering a period of nine months ended December, 1915, very little work has been done in the balata industry in that district during the period covered and no large yields are expected for the present year.

The Consolidated Rubber & Balata Estates, Limited, surrendered 73 of their licenses. The following table shows the shipments of balata for the nine months:

Barima District	385 pounds
Barama District	1,461 "
Total	1,846 pounds

The imports of balata from Venezuela into British Guiana during the period covered amounted to 29,945 pounds valued at \$7,761.78.

The area under rubber was increased 50 acres and the Consolidated Rubber & Balata Estates, Limited, was engaged in extending the cultivation on the land held by them under lease on the Aruka river; 80 acres were cleared and 47 acres empoldered and planted up with Para rubber—100 plants to the acre—and interplanted with catch crops of ground provisions.

This company was engaged in tapping the trees of the David Young Estates, Aruka, now the property of the company. They shipped from this plantation more than 5,000 pounds of rubber of very good quality.

The tapping at the experimental station was continued with satisfactory results, and a further block of trees was prepared for tapping in the present year.

During the period covered by the report the rubber cultivation of the district was rather severely attacked by the

Hevea leaf disease. Active measures consisting in spraying with Bordeaux mixture were undertaken to cope with the disease. It was, however, impossible to say whether the steps taken would eradicate it. The Assistant Director of Science and Agriculture, Mr. Bancroft, visited the district during November in connection with the outbreak of the disease.

There was no increase in the area under rubber cultivation at the Experimental Station. The existing cultivation was, however, well maintained.

RUBBER TIRES IN GUATEMALA.

THE American Consul at Guatemala City, Guatemala, has made a very interesting and timely report on the use of rubber tires in that country.

In Guatemala City rubber tires are used on approximately 307 carriages of all sorts, 113 automobiles, 573 bicycles and 17 motorcycles; a total of 1,110 vehicles, and it is safe to say that in the rest of the country there are not more than 15 or 20 automobiles and rubber-tired carriages, while bicycles and motorcycles are practically unknown outside of that city.

CUSTOMS TARIFF.

There is no specific provision in the Guatemalan customs tariff for rubber tires, but, upon request from the Consul, the Director General of Customs stated that such tires were classed with carriages and their accessories, and paid duties ranging from \$4.09 to \$7.21 per 100 pounds.

When shipped alone rubber tires are taxed \$7.21 per 100 pounds, but when shipped with vehicles are subject to the same duty as the vehicle to which they appertain.

All of the duties are payable one-half in United States currency and one-half in the money of the country.

IMPORTS OF TIRES.

Tires are not listed as separate items in Guatemalan import returns, but are included under several headings, "Accessories for vehicles," "Automobiles and accessories," "Vehicules, bicycles and accessories," which include so many things besides rubber tires that it is hardly possible to form an idea of the amount and source of the tire imports.

RUBBER IMPORTS OF THE DOMINICAN REPUBLIC.

The American Vice-Consul at Santo Domingo reports that during the year 1915 the Dominican Republic imported rubber and manufactures of rubber from the United States amounting to \$31,965. Porto Rico ranked second with \$1,800; \$365 was imported from France; \$215 from Spain; \$118 from Germany, and only \$79 worth of rubber goods were imported from Great Britain. During the year covered by the report, \$66 of waste rubber was shipped from Santo Domingo to the United States.

RUBBER GOODS IMPORTED BY ARGENTINA.

In a report for the year 1915 just published, the American Vice-Consul at Buenos Aires states that during the year Argentina imported \$103,153 of rubber tubing, weighing 363,196 pounds, and other rubber goods valued at \$193,175, of which the weight and nature are not given.

THE FIRST RUBBER FACTORY IN JAVA.

The Nederl. Indische Caoutchouc Fabriek (Netherlands India Rubber Works), Bandoeng, Java, is the name of the rubber company that will soon start manufacturing mechanical rubber goods in the island of Java. According to L. A. van Rijn, director of the company, who passed through New York on his way to the Far East, the machinery is being installed as rapidly as possible and later on the company will undertake the manufacture of solid tires. Mr. van Rijn was formerly manager of the Netherlands Gutta Percha Co., Singapore, Straits Settlements, mention of which was made in THE INDIA RUBBER WORLD, July, 1907.

PROPOSAL TO REDUCE TARIFF ON MANUFACTURES OF BRAZILIAN RUBBER.

A bill has been introduced into the Brazilian Congress proposing to encourage the consumption abroad of Brazilian rubber by means of reduced import duties on products manufactured of such rubber. The new bill provides for a reduction of 95 per cent of the ordinary duties on such articles, if they are accompanied by a declaration from the manufacturer, duly authenticated by a Brazilian consul, attesting that the goods are made of "Fine Para" rubber. The words "Para Rubber, Brazil" or their equivalent in the language of the country of origin must be stamped on such articles. On certain grades of insulated wires and cables, in the manufacture of which Para rubber has been used, the regular duty is to be reduced 90 per cent. It is proposed to make pneumatic automobile tires not made of Brazilian rubber (present rate 5 per cent ad valorem) dutiable at 15 per cent ad valorem.

This measure differs from the Budget Law passed by the Brazilian Congress in 1915 in that no discriminatory surtaxes are imposed on articles made of other than Brazilian rubber. The 1915 law fell into disuse because there were no means for distinguishing between the contents of pure Para and other rubbers. With a view of remedying this difficulty, the new bill prescribes a number of tests for determining whether articles are made of Brazilian rubber. Thus goods admitted at the reduced rates must stretch six times their size without breaking and must stand all the elasticity and compression tests required by certain French organizations such as the French State Railways, the Arsenal at Châtelleraut, and the Forges et Fonderies de Pont-à-Mousson, and may also be subjected to other tests.

Commenting upon this proposed modification of the Brazilian customs laws, our contemporary, "Wileman's Brazilian Review," says that the Brazilian import trade in rubber goods is not very big and that it doubts if many will be induced to certify that the constituents of goods that consist "for the great part of chemicals" contain purely Para rubber, but some no doubt will be found, and among them probably the parties that the bill promoted by Dr. Passos Miranda will favor. If it is left to the discrimination of the Custom House, it is pretty certain that few manufactures will pass the test and that those which do will get a practical monopoly. Our contemporary further suggests that this probably is the real object of the promotion of the bill.

A rubber manufacturing industry is being gradually developed in Brazil, thanks to the protective customs tariff, and it is thought a reduction of the tariff such as proposed in this bill would mean its extinction.

PARCEL-POST CONVENTION WITH CHINA.

A development of interest to all exporters, including rubber concerns, is the parcel-post convention recently concluded between the United States and China and which took effect August 1, 1916.

Parcel-post packages exchanged between these two countries must not weigh more than 11 pounds nor measure more than 3 feet 6 inches in length, and 6 feet in length and girth combined, and, in the case of parcels for or from non-stream-served places in China, must not exceed 25 cubic decimeters [1 cubic foot] in volume.

Postage on parcels sent from the United States to China is at the rate of 12 cents per pound or fraction of a pound; and from China to the United States at the rate of 35 cents (Chinese currency) per pound or fraction of a pound, except that on parcels for or from non-stream-served places in China an additional Chinese domestic parcel-postage may be levied and collected by the Chinese service. Parcel-post packages for China may be registered.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED JULY 18, 1916.

- N** O. 1,191,200. Clothing protector comprising a protective apron of moisture proof material. M. J. Liebenstein and L. H. Einsmeier, assignors to A. Stein & Co.—all of Chicago, Ill.
- 1,191,219. Hose clamp. C. Pelter, assignor of one-half to J. L. Eggers—both of Walla Walla, Wash.
- 1,191,318. Automatic tire alarm. F. N. Kelsey, assignor to A. H. Bowditch—both of New Haven, Conn.
- 1,191,320. Hose supporter. T. P. Kuche, assignor to A. Stein & Co.—both of Chicago, Ill.
- 1,191,402. Demountable rim. A. J. Glau, San Ardo, Calif.
- 1,191,444. Graft practicing device comprising an elastic hollow loop. A. G. Leff, Washington, D. C.
- 1,191,498. Combination leather sole and rubber heel. O. C. Davis, Brockton, Mass.
- 1,191,500. Rubber sole with imitation welt strip. O. C. Davis, Brockton, Mass.
- 1,191,516. Nipple protector. R. Keil, New York City.
- 1,191,543. Shoe shank arch cushion comprising a solid rubber block. J. A. Smith, assignor of one-half to W. N. Dorsett—both of Washington, D. C.
- 1,191,577. Demountable rim. R. A. Eckberg, Des Moines, Iowa.
- 1,191,578. Massage brush. O. England, Chicago, Ill.
- 1,191,604. Shaving brush. O. S. McCurdy, Wilkinsburg, Pa.
- 1,191,785. Corset. R. Heindrich, New York City.
- 1,191,788. Water shoe. A. P. Horn, Fort Thomas, Ky.
- 1,191,820. Rubber stamp. W. J. Pannier, Jr., assignor to Pannier Bros. Stamp Co.—both of Pittsburgh, Pa.
- 1,191,836. Life-preserving jacket. S. Sarosiek, Nutley, N. J.
- 1,191,866. Rubber tired vehicle wheel. E. Amodeo-Salvator, Brooklyn, N. Y.
- 1,191,894. Spring tire with rubber cushions. J. E. Hart and A. Benzing, Columbus, Ohio.

ISSUED JULY 25, 1916.

- 1,192,036. Resilient tire. T. L. Carbone, Charlottenburg, Germany.
- 1,192,038. Dust cap for tire valves. C. W. Cleveland, Louisiana, Mo.
- 1,192,039. Tire construction block comprising two rubber disks. A. D. Converse, Winchendon, Mass.
- 1,192,090. Automobile tire. R. M. Merriman, Akron, Ohio.
- 1,192,147. Demountable rim tool. O. A. Wood, Blissfield, Mich.
- 1,192,149. Tire armor. P. W. Anderson and J. T. Kennelly, Rawlins, Wyo.
- 1,192,186. Respirator. S. W. Greene, East Greenwich, R. I.
- 1,192,222. Rim for automobile tires. J. S. O'Gorman, Portland, Oreg.
- 1,192,238. Inner tube for pneumatic tires. R. C. Sprattling, assignor to Opelika Pneumatic Tube Co.—both of Opelika, Ala.
- 1,192,259. Water-matching wheel embodying an annular pneumatic tire-like tube. J. N. Anderson, Lincoln, N. H.
- 1,192,291. Protector for pneumatic tires. R. G. Falconer, Litchfield, Ohio.
- 1,192,352. Tire valve cap. O. A. Smith, assignor of one-half to E. C. Henn—both of Cleveland, Ohio.
- 1,192,357. Inhaler. W. R. Thatcher, Oskaloosa, Iowa, and H. Dixon, Dayton, Ohio.
- 1,192,495. Resilient tire. J. F. Carlson, Attica, Ind.
- 1,192,496. Resilient tire. J. F. Carlson, Attica, Ind.
- 1,192,554. Internal armor for pneumatic tires. A. Nielsen, Brigham, Utah.
- 1,192,622. Tann connection for connecting a suction hose with a fire hydrant. W. H. B. Halahan, Rye, N. Y.
- 1,192,648. Tire protector. J. T. Landiche, Remy, La.
- 1,192,683. Catamenial appliance. S. B. Potter, Washington, D. C.
- 1,192,831. Playing ball. W. N. Knight, Belleville, assignor to St. Mungo Manufacturing Co. of America, Newark—both in New Jersey.

ISSUED AUGUST 1, 1916.

- 1,192,853. Tire rim. P. W. Burford, East Rochester, N. Y.
- 1,192,860. Coupling for gas hoses. J. J. Carey, Brooklyn, N. Y.
- 1,192,924. Automobile tire protector. R. S. Miller, Red Sulphur Springs, W. Va.
- 1,192,969. Massage appliance. E. Winton-Charteris, London, England.
- 1,193,011. Hose nozzle. H. Gibbs, assignor to W. D. Allen Manufacturing Co.—both of Chicago, Ill.
- 1,193,086. Faucet spray attachment. M. Thomsen, Chicago, Ill.
- 1,193,088. Demountable rim. H. J. Trares, Edwardsville, Mo.
- 1,193,108. Rubber tire. A. K. Allen and C. A. Allen, Seattle, Wash.
- 1,193,198. Resilient heel. J. Solomon, Oberlin, Ohio.
- 1,193,250. Automobile floor mat. G. F. Foss, Montreal, Quebec, Canada.
- 1,193,287. Beard softener of rubber. T. G. Morgan, Shamokin, Pa.
- 1,193,392. Anti-skid tire chain. R. T. Hughes, Kansas City, Mo.
- 1,193,476. Force pump. M. Block, assignor to Illinois Force Cup & Specialty Co.—both of Chicago, Ill.

ISSUED AUGUST 8, 1916.

- 1,193,500. Auxiliary tread. O. Hasten, assignor to Rutherford Rubber Co.—both of Rutherford, N. J.
- 1,193,524. Atomizer. T. A. De Villus, assignor to The De Villus Manufacturing Co.—both of Toledo, Ohio.
- 1,193,529. Bath mitten, comprising a mitten of rubber sponge and a tough rubber lining the inner sole. J. Ellis, Chicago, Ill.
- 1,193,608. Insole forming an inflatable arch support. F. O. Poulson, Roswell, N. Mex.
- 1,193,715. Fabric for tires and the like. R. B. Price, assignor to Rubber Regenerating Co.—both of Mishawaka, Ind.
- 1,193,781. Demountable rim for vehicle wheels. C. F. Heinig, assignor of one-fourth to M. L. Baughman—both of Indianapolis, Ind.
- 1,193,810. Demountable rim. G. S. Maxwell, assignor of one-half to M. A. Bayles—both of Washington, D. C., and W. F. Hale, Nokesville, Va.
- 1,193,865. Dust cap for valve stems. R. M. Brown, Wilmington, Ohio.
- 1,193,991. Rubber top. F. A. Cigol, Little Falls, N. J.
- 1,193,922. Musical rubber ball. F. A. Cigol, Little Falls, N. J.
- 1,194,020. Demountable resilient tire seating rim for automobile wheels. J. G. Hodgson, Maywood, Ill.
- 1,194,081. Resilient tire. E. L. Scranton, Rising Sun, Ind.
- 1,194,120. Cushion tire. J. S. Bahen, Rock Island, Ill.
- 1,194,136. Demountable rim. B. A. Bryon, Ridgefield, Conn.
- 1,194,152. Cushion insole for boots and shoes. F. F. Douglas, Minnedosa, Manitoba, Canada.
- 1,194,161. Antiskidding device for tires. G. B. M. Foust, assignor to C. H. Keith—both of Cleveland, Ohio.
- 1,194,177. Cushion tired wheel. A. T. Henderson, assignor to The Henderson Rubber Co.—both of Baltimore, Md.
- 1,194,193. Adjustable sweat band, comprising elastic sections, for headwear. L. Kronthal, New York City.
- 1,194,215. Medicine applicator and moistener. J. O. Morrison, Anderson, Ind.
- 1,194,235. Armored tire. R. E. Stump, Fresno, Calif.
- 1,194,279. Blow-out patch for pneumatic tires. J. N. Davis, Denver, Colo.
- 1,194,285. Guard rim for pneumatic tires. J. R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.
- 1,194,322. Vehicle tire construction. W. S. Temple, Mount Vernon, Ohio.

THE DOMINION OF CANADA.

ISSUED APRIL 30, 1916.

- 168,564. Fly swatter composed of a perforated web of rubber. The Standard Vending Machine Co., Hazelton, assignee of G. W. Gombor, Conyngham—both in Pennsylvania.
- 168,583. Life preserver. G. E. Fell and G. A. Fell, Buffalo, N. Y.
- 168,639. Protector and non-skidding band for tires. A. T. Hughes, Kew Green, Surrey, England.
- 168,719. Life preserver. The American Life Buoy Co., assignee of B. Franklin—both of Chicago, Ill.
- 168,811. India rubber shoe pad. W. W. Phillips, 142, 144 and 146 Old street, London, England.
- 168,813. Syringe. J. H. Pruitt, Fort Myers, Florida.
- 168,919. Test cup for milking machines. T. N. Fletcher, Hamilton, Auckland, New Zealand.
- 168,980. Ear drum. G. J. Wagar, Detroit, Mich.
- 169,020. Tire calipers. The B. F. Goodrich Co., New York City, assignee of J. R. Gammeter, Akron, Ohio.
- 169,021. Tire calipers. B. F. Goodrich Co., New York City, assignee of H. E. Curtis, Dayton, Ohio.
- 169,058. Pneumatic tire. A. Baigne, Montreal, Quebec, Canada.
- 169,068. Method of marking rubber. M. H. Clark, Hastings-on-Hudson, N. Y.
- 169,105. Nasal irrigator. C. H. W. Moellering, Newark, N. J.

THE UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

In order to give the public the advantage of having abridgments of specifications up to date and of retaining the numerical sequence, applications for patents made subsequent to 1915 are given new numbers when their complete specifications are accepted, or become open to public inspection before acceptance. The new numbers start with No. 100,001 (without any indication of date), and supersede the original application numbers in all proceedings after acceptance of the complete specifications.

- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JULY 5, 1916.]
- 4,073 (1915). Waterproof waistcoat lined with a film of rubber. W. T. Gifford, 59 Beaver Hall Hill, Montreal, Canada.
- *4,076 (1915). Galvanic battery separator made by cutting slices from a block built up from layers of rubberized cloth, of cloth and rubber, compressed, and vulcanized. T. A. Willard, 8177 Carnegie Avenue, Cleveland, Ohio.
- 4,084 (1915). Stocking suspenders. J. H. B. Dawson, Foster Road, Parkstone, Dorset.

*Denotes Patents for American Inventions.

- *4,094 (1915) Spine wheel with outer end tire and rubber cushions. W. M. Henna, 1733 Broadway, Manhattan, N. Y.
- 4,446 (1915) Flexible fabric for deck-chairs, seats, hammock beds, mats, etc., made of these types of reinforced rubber sheeting, folded and interlocked. A. A. Scott, 6 Spring Gardens Road, Bradford.
- 4,448 (1915) Rubber coated plates and medicament bottles. E. S. Johnson, 115 Fleet street, London.
- 4,451 (1915) Splash guard for automobiles, etc., comprising an india-rubber strap. P. Christensen, Vesterløgsgade, Copenhagen.
- 4,452 (1915) Gaskets for liquid comprising a rubber disk. F. A. Bouty, 3bis Rue de Dunkerque, Paris.
- 4,497 (1915) Locking nut for tire valves. E. Bellan, 139 Avenue de Villiers, Paris.
- 4,515 (1915) Combined ear-protecting device and megaphone having a covering of rubber round the rim. J. A. MacLellan, Newton Club, Newton Abbot, Devonshire.
- *100,395. Wheel tire. E. H. Herick, 35 East 30th street, New York City.
- *100,397. Pneumatic tire. A. H. Harris, 342 6th street, Barberton, Ohio.
- 100,405. Conveyor belts formed of transverse corrugated sheet of rubber or aluminum links laid on longitudinal straps of balata. C. T. Gums, Denmark.
- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JULY 12, 1916.]
- 4,363 (1915) Armored hose. G. Mitchell, 32 Queen Victoria street, London.
- 4,494 (1915) Textile driving belts impregnated with rubber and balata. W. Kohlschütter, G. Rothmund and G. Rothmund & Co., 65 Bartels Strasse, Hamburg, Germany.
- 4,531 (1915) Twin tires and rings of rubber. S. H. Cope and Warland Dual Rim Co., Alma street, Aston, Birmingham.
- 4,579 (1915) Ear plug. T. N. Atkinson, 26 Hart street, Holborn, London.
- 4,623 (1915) Wheel tires. J. E. Howard, La Massette, St. Peters, Jersey, Channel Islands.
- 4,626 (1915) Vehicle wheels. P. H. Benjamin, 35 St. Finsburg street, Malvern, Johannesburg, South Africa.
- 4,693 (1915) Double-ended air tubes for tires. Dunlop Rubber Co., 14 Regent street, Westminster, and C. MacBeth, Manor Mills, Salford street, Aston, Birmingham.
- 4,739 (1915) Funnel for liquids made of waterproof canvas. Asiatic Petroleum Co., St. Helens Court, St. Helens, London, and H. Avery-Jones, Stone House, Fownhope, Herefordshire.
- 4,745 (1915) Respirators. M. Stern & Co., and S. Goldreich, 18 Rope-maker street, London.
- 4,761 (1915) Rubber-sheathed electric cables. British Insulated & Helsby Cables, Prescott, Lancashire, and J. Brotherton, Cable Works, Helsby, Cheshire.
- 4,765 (1915) Hose couplings. Electric Hose & Rubber Co., Caxton House, Westminster, and R. H. Carr, Standard Buildings, City Square, Leeds.
- 100,451. Rubber layers in boot heels. T. H. Robinson, 2 Grosvenor place, Carlton, Victoria, Australia.
- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JULY 19, 1916.]
- *4,863 (1915) Puncture repair plug. B. W. Spitzer, 52 Claybourne street, Dorchester, Mass.
- 4,921 (1915) Spring wheel with continuous outer rigid ring and pneumatic cushions. B. O. Bergersen, 38 Rangitikei street, Palmerston North, New Zealand.
- 5,023 (1915) Tire tube. T. H. B. Gayner, 113 Neville street, Middle Park, Victoria, Australia, and Western Canadian Enterprises, 512 Dominion Building, Vancouver, British Columbia.
- *100,500. Resilient heel, comprising a rubber lift and one or more leather lifts. A. K. Pomeroy, Williamstown, N. J.
- 100,518. Hose couplings. H. T. Stephens, Tahoonia, Ferryside, South Wales, and C. E. Baker, 34 Blue street, Car marthen.
- 11,425 (1914) Signaling horns in which rubber-faced gripping jaws are used. M. J. I. P. Bonard, 1654 Esplanade, Montreal, Quebec, Canada.
- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JULY 26, 1916.]
- 5,179 (1915) Rubber chin rest for violins. R. S. Williams, 145 Yonge street, Toronto, Canada.
- *5,208 (1915) Containers for tobacco, tea, coffee, spices, etc., made from a blank, the edges of which are treated with rubber. J. Peterson, 50 Union Square North, New York City.
- 100,544. Method for securing a tread band to a tire cover. T. Doyens, 21 rue de la Gare, and R. Hustins, 10 Spoorweglaan—both in Maastricht, Holland.
- 100,554. Rubber bands in banking wallets. A. Masser, 10 St. James Road, Watford.
- 100,571. Tire gages. H. Fairbrother, 30 Ludgate Hill, London.
- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, AUGUST 2, 1916.]
- 5,463 (1915) Pneumatic tire cover. R. L. Gould, 5 Corporation street, Birmingham.

NEW ZEALAND.

ISSUED JUNE 22, 1916.

- 36,351. Detachable rim for solid or pneumatic tires. C. A. James, Prescott Terrace, Kose Park, and F. F. Milford, Portrush Road, Torak—both in South Australia.
- 36,632. Tear cup inflator tube. G. W. Gane, Normanby, and J. Hopkirk, Haversham Road, New Zealand.
- 37,487. Milking machine test cups. J. Treloar, Hamilton, N. Z.

THE FRENCH REPUBLIC.

PATENTS ISSUED (WITH DATES OF APPLICATION).

- 479,637 (September 2, 1915). Elastic tire for vehicle wheels. J. Guettero.
- 479,685 (September 7, 1915). Improvements in elastic-tired wheels. A. Toncea.
- 479,728 (September 13, 1915). Improved air tubes for pneumatic tires. A. E. Hemmerson.
- 479,735 (September 14, 1915). Pneumatic horse collar. O. F. Hurley.
- 479,788 (September 21, 1915). Puncture-proof elastic tire. H. E. Wolken.
- 479,790 (September 21, 1915). Improved wheel rims. Dadey and Sellberg.
- 479,804 (September 22, 1915). Improvements in detachable shoe heels. J. Drew and H. Drew.
- 479,821 (September 24, 1915). Pneumatic tire valves. R. Walmsley.
- 479,829 (September 25, 1915). Improved vehicle wheels with detachable rims. The Standard Welding Co.

TRADE-MARKS.

THE UNITED STATES.

- 91,726. The word VESY—lightweight rubber shoes. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind.
- 91,742. The word MAGIC—rubber goods. Eastern Rubber Co., Philadelphia, Pa.
- 94,331. The word HOU-TEX—raincoats, etc. Leopold & Price, Inc., Houston, Tex.
- *94,400. An illustration of a hub—rubber hose reinforced with fabric. United States Rubber Co., New York City.
- 94,341. The word HUMARK—rubber hose reinforced with fabric. United States Rubber Co., New York City.
- 94,342. The word HUB—rubber hose reinforced with fabric. United States Rubber Co., New York City.
- 95,224. An illustration of the words THE GRANGER SHOE, and figure of a man sharpening a scythe—leather, canvas and rubber shoes. J. P. Masen, Boston, Mass.
- 95,248. The word UTULUS—rubber hose reinforced with fabric. United States Rubber Co., New Brunswick, N. J.
- 95,260. The words OLD COLONY—rubber belting, rubber hose, and rubber packing. G. B. Carpenter & Co., Chicago, Ill.
- 95,630. An illustration of a square with the word Nu-TEX over a circle—shoes and slippers having fiber-rubber soles, etc. Morton Samuels, Baltimore, Md.
- 93,204. The words NEW ERA inclosed in an annular frame or band—rubber heels for shoes. The Goodyear Tire & Rubber Co., Akron, Ohio.
- *94,190. An illustration of a triangle and circle, in the center the letters C T & S, and bordering the triangle the words THE CLEVELAND TOOL & SUPPLY COMPANY—balata, rubber belting, packing, hose, etc. The Cleveland Tool & Supply Co., Cleveland, Ohio.
- 95,240. The word GRANITE—piston and sheet-packing consisting of rubber and fibrous material. Revue Rubber Co., Providence, R. I.
- 95,644. The figures 40—hot-water bottles. The Faultless Rubber Co., Ashland, Ohio.
- *96,168. An illustration comprising a wreath and circle and within the circle the letter S P F—shoes made of combinations of leather and rubber, etc. Sutherland Pedigo Farwell Shoe Co., St. Louis, Mo.
- 75,360. The word PARA-TEX—rubber aprons, rubber gloves, and rubberized rain-coats. W. MacPherson, Cambridge, Mass.
- *87,713. A design below the word KEYSTONE—garters, armbands, and trousseau-belts. C. L. Meyer, Pittsburgh, Pa.
- 91,690. The word ASHER—light-weight rubber shoes. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind.
- 93,831. The letters CC—machinery packing composed of rubber. Crane Co., Chicago, Ill.
- 94,859. The word MULTIRESTOR—tire-tape. Standard Woven Fabric Co., Framingham, Mass.
- 95,626. The word "VELVEY"—inner tubes. Lee Tire & Rubber Co., White-marsh township, Montgomery county, Pa.
- 95,671. The word COMMANDER—pneumatic tires. The B. F. Goodrich Co., New York City.
- *95,783. The word BELLS OF BROADWAY—shoes made of canvas and rubber, etc. The Elbinger Shoe Manufacturing Co., Lebanon, Ohio.
- 93,327. The words PARA OKE, A. & A. R. Co., and 100% LINE within a circle—shoe soles and heels made of a composite material containing animal and vegetable matter. A. & A. Rubber Co., Framingham, Mass.
- *93,393. The word PIONEER—rubber tires, inner tubes, patches, etc. Powell Supply Co., Omaha, Neb.
- *93,921. REPRODUCTION OF TWO TYPES OF tire valves for pneumatic tires. Double Seal Tire Valve Co., New York City.
- *96,233. The words THE LITTLE GIANT—syringes and parts thereof. G. W. Jessup, Boston, Mass.

341. The word **McKENNOS**—friction tape. Standard Waxed Fabric Co., Walpole, Mass.
- 96,506. The word **PIERCE**—rubber belts, overalls and garters. Pioneer Suspender Co., Philadelphia, Pa.
- 96,545. The words **DEAR NOT**—rubber heels. Killion Rubber Co., Boston, Mass.
- 96,608. The word **ROXAS**—soles for boots and shoes. United States Rubber Co., New York City.

CANADA

- 1,649. Representation of a rubber vessel across which the word "BIBBENS" is placed on a panel; above are the words "MADE IN CANADA" and below "ALANASTAR" Co. Ltd., Ltd., Montreal, Quebec.
- 21,661. Black tread band used with sides of contrasting color, particularly light gray or white—pneumatic tires. The E. E. Goodrich Co., New York City.
- 1,666. Black tread band with sides of rubber, reddish color—pneumatic tires. The E. E. Goodrich Co., New York City.

THE FRENCH REPUBLIC

- 23,738. The word **ACCLERENE**—chemical product for use in the rubber industry. Hooley Hill Rubber & Chemical Co., Limited, Stamford Road Works, Hooley Hill, near Manchester, England.
- 23,780. The words **TALON ACHILLE**—rubber heels. Hooley Hill Rubber & Chemical Co., Limited, Stamford Road Works, Hooley Hill, near Manchester, England.
- 23,781. The word **EMPE**—rubber heels, soles, tips and other rubber findings for footwear. Hooley Hill Rubber & Chemical Co., Limited, Stamford Road Works, Hooley Hill, near Manchester, England.
- 23,782. The word **BUFFALO**—Same.
- 23,783. The word **STANDARD**—Same.
- 23,784. The words **DAL PAD**—Same.
- 159,250. The word **PARANEIGE**—proofed garments. Société Potier Frères, Paris.
- 159,208. The words **AMERICAN COMPANY, A. V.**, on a turnable rubber heel—rubber heels. Alfred Verlessen, Paris.
- 159,250. The word **VAINGUEUR**—hard rubber hair combs. Société Veuve Moulard & H. Georgeau, Paris.
- 159,251. The words **L'ANTI-BOCHE**—Same.
- 159,281. The word **THERMOCOPO**—rubberized and elastic fabrics and other goods. Société Industrielle et Commerciale du Kapok, Paris.
- 159,290. The word **RADIOCOPO**—Same.
- 159,291. The word **CALORCOPO**—Same.
- 159,292. The word **RADIA**—Same.
- 159,293. The word **FORSHO**—Same.
- 159,294. The word **CALOR**—Same.
- 159,295. The word **THERMOS**—Same.
- 159,362. The word **MICADO**—proofed wearing apparel. Arthur Dufour, Paris.
- 159,458. The words **PLUS-QUE-PARFAIT**—rubber goods for medical, surgical, hygienic and toilet purposes. Albert Eugène Fromont, Paris.
- 159,459. The words **MATHEUS DE PARIS**—Same.
- 159,460. The words **MATHEUS PARISIEN**—Same.
- 159,461. The words **MATHEUS DE FRANCE**—Same.
- 159,462. The words **MATHEUS FRANCAIS**—Same.
- 159,463. The words **MATHEUS NATIONAL**—Same.
- 159,464. The word **GATWING** with a drawing of a goat—Same.
- 159,465. The word **YABON**—Same.
- 159,466. The word **ANAMA**—Same.
- 159,467. The word **ANIRI**—Same.
- 159,507. A label with crossed French, Belgian and English flags and the words **ALLIANCE NOUVELLE DE REPRESENTATION COMMERCIAL, ANGLAIS-FRANCO-BELGE**—miscellaneous articles of merchandise including rubber goods. Girard, Paris.
- 159,616. The words **SEMELLE DE SANTÉ**—proofed soles for footwear. Leopold Levy, Paris.
- 159,639. The words **L'AUTO-IMPERMEABILISATEUR**—composition for cleaning, disinfecting and waterproofing fabrics and all kinds of garments. G. Lakovsky, Paris.

DESIGNS.

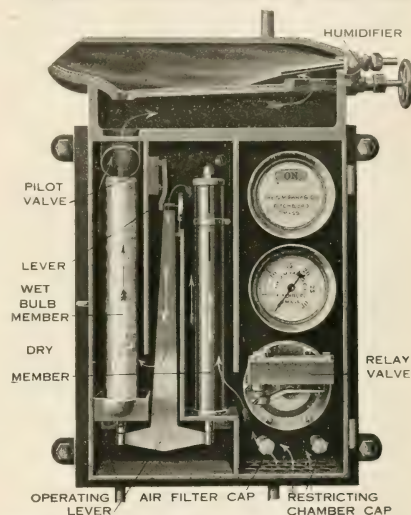
THE UNITED STATES

- 49,461. Gasket. M. J. Fichtenstein, assignor to A. Stein & Co.—both of Chicago, Ill.
- 49,463. Vehicle tire. R. J. Stokes, assignor to Thermoid Rubber Co.—both of Trenton, N. J.
- 49,464. Vehicle tire. R. J. Stokes, assignor to Thermoid Rubber Co.—both of Trenton, N. J.
- 49,467. Elastic vehicle wheel. W. E. Wilson, assignor to The American Tire & Rubber Co.—both of Akron, Ohio.
- 49,433. Rubber tire. C. E. Jenkins, Chicago, Ill.
- 49,485. Vehicle tire. M. J. Gilten, assignor to Standard Tire & Rubber Manufacturing Co.—both of Cleveland, Ohio.

PREVENTING SPREADER-ROOM FIRES.

THE spreader and churn rooms of modern rubber mills are equipped with machinery that absorbs much static electricity. When the natural humidity falls below 40 per cent, the naphtha vapors are extremely liable to become ignited by a static spark and cause a disastrous fire. An artificial humidifying instrument that will raise the moisture content of the air to the point of safety is therefore interesting, and is here illustrated. This instrument is adjustable to any desired relative humidity and is extremely sensitive.

In operation the humidifier induces an air current which



enters the base of the casing and passes successively over the dry and wet bulbs, up through the aspirator intake, to the condensation chamber.

The humidifier supersaturates this continuous sample of air, which then passes through the aspirator outlet, leaving behind it an excess of unevaporated water at the hygrometric wet bulb temperature. This water trickles down through the drip outlet upon the upper end of the wet bulb, which is surrounded by a linen mantle. The slight evaporation from this mantle due to the air current, insures the continuance of the hygrometric temperature.

The lower ends of both thermostatic members are secured to brackets, and internal rods of non-expandable metal connect their upper ends with the outer ends of the operating lever. Therefore, any change in the relative length of the two thermostatic members will slightly rock the lever, thus bringing it in or out of contact with the pilot valve lever. This pressure raises the upper end of the lever from a small pilot valve seat, permitting the escape of air from the relay valve diaphragm, which operates the humidifier valves that are attached to the overhead air and water pipes.

Air for operation is taken from any convenient main, through a special filter, and then to the frame of the instrument, whence a portion is diverted through a stop valve for the humidifier. [G. M. Parks Co. Fitchburg, Massachusetts.]

Review of the Crude Rubber Market.

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NEW YORK.

AUGUST has been a very quiet month for crude rubber, a condition that was generally anticipated in the trade at this time. Extreme dullness has characterized the market, with only routine business to occupy the attention of importers and dealers. Inquiries were few and lacked the real buying tone that has apparently been absent from the New York market for some time. Plantation prices are practically the same as they were a month ago, at figures about one cent lower than the London market. The fluctuations noted in the foreign primary markets during the month have been reflected locally, but without resulting in any business to warrant further price activity.

A peculiar condition of the New York market is noticed in the fact that sales have been made at less than ruling prices, while attempts to buy on the London market at ruling prices are invariably met with one-half to one cent advance.

The feature of the month has been the continued firmness of Upriver fine and there was a noticeable scarcity of this grade toward the end of the month. The natural result of this condition has been the stiffening of prices on the other grades. Plantation rubber appears to be well supported during the period of waiting that exists in the belief that First latex at 55 cents is a near possibility. Until buying orders are placed for large quantities or some unusual disturbance occurs in the primary markets, there is small prospect of a change in the local situation.

During the first three weeks in August, 4,600 tons of crude rubber arrived in New York, compared to 3,530 tons for the same period in July. There were as follows: Plantations from London and Liverpool, 700 tons; Singapore, 950 tons; Colombo, 400 tons; Batavia, 500 tons; Para rubber from Brazil, 615 tons; Europe, 95 tons; Centrals, 380 tons; Africans, 436 tons; Manicoba, 20 tons; Guayule, 4 tons. From August 8 to 18, 500 tons of Plantation were received at Seattle, compared to 335 tons for the same period in July.

LONDON.

The unsettled condition of this market during August has been evidenced by irregular buying that has caused minor price fluctuations which have not really affected the general situation. While the American demand, Plantations best customer, remains apathetic there is not much hope for improvement. On August 1, Standard crepe spot, was done at 2s. 2½d. [57.27 cents] and Smoked sheet for 2s. 13½d. [52.20 cents]. Hard fine Para spot, sold at 2s. 10d. [68.92 cents]. On August 29, Standard crepe spot, sold for 2s. 3¼d. [55.24 cents] and Smoked sheet was done at 2s. 3d. [54.73 cents].

During July London imports were 4,553 tons, reexports 2,800 tons. Liverpool imported in the same period 906 tons and re-exported 771 tons. Total imports for both ports were 5,459 tons, against 4,288 for July.

SINGAPORE.

At the auctions held August 4, 11, 16 and 24, about 1,350 tons were sold. First latex crepe and smoked sheet brought an average of 50 cents a pound.

UPRIVER, coarse, new	43 @	40¼ @	41½ @
UPRIVER, coarse, old	43 @	38 @	39 @
Islands, coarse, new	27 @ 28	28½ @	28 @
Islands, coarse, old	.....	.....	.....
Cameta	28½ @ 29	32 @	33 @
Cauchio, ball, upper	42½ @ 43	41 @	41½ @
Cauchio, ball, lower	40 @ 41	36 @	36 @

PLANTATION.

First latex crepe	Spot. 59 @ 60	Spot. 58 @	56½ @
	Float 58½ @ 59	Futures 58 @	57 @
Amber crepe, light	.....	Spot. 56 @	55 @
	.....	Futures 56 @	53 @
Brown crepe, clean	.....	Spot. 54 @	52 @
	.....	Futures 52½ @	51½ @
Smoked sheet, ribbed	Spot. 58½ @ 59	Spot. 57½ @	56½ @
	Float 58½ @	Futures 57 @	56½ @
Fine sheets and biscuits, unsmoked	57 @ 58	.....	.....

CENTRALS.

Cambo	40 @	41 @	39 @
Esmeralda, sausage	40 @	40 @	39 @
Nicaragua, scrap	38 @ 39	39 @	38 @
Mexican plantation, sheet	.....	.....	.....
Mexican, scrap	40 @ 41	.....	.....
Mexican, slab	.....	28 @ 30	.....
Manicoba	35 @ 40	42½ @	42½ @ 45
Manicoba, sheet	35 @ 40	40 @	37½ @
Guayule	32 @ 33	35 @	32 @ 33
Balata, sheet	55 @ 56	72½ @	79 @
Balata, block	45 @ 47	41 @	50 @

AFRICAN.

Lepori, ball, prime	53 @ 54	53 @	52 @
Lepori, strip, prime	.....	.....	52 @
Upper Congo, ball, red	51 @ 53	52 @	51 @
Rio Nunez Niggers	52½ @ 53	53 @	53 @
Conakry Niggers	51 @ 52	53 @	51 @
Masou, red	50 @ 52	51 @	51 @
Soudan, Niggers	.....	.....	50 @ 51
Cameroon, ball, soft	44 @	.....	.....
Cameroon, ball, hard	.....	.....	.....
Benguela, No. 1	31 @	36½ @	38 @
Benguela, No. 2	.....	35½ @	35 @
Acra, flake	23 @ 23½	33 @	35 @

EAST INDIAN.

Assam	42 @	40 @	38 @
Pontanuk	6¼ @ 7	8 @	6½ @
Gutta Siak	12½ @ 14	18 @ 19	17 @
Gutta red Nigger	.....	24 @ 25	25 @
Borneo III	.....	.....	.....
Gutta Percha	2.00 @ 2.50	1.50 @ 2.50	1.50 @ 2.50

COMPARATIVE NEW YORK PRICES FOR AUGUST.

Commercial paper has been moving freely this month, the best rubber names going at 4½ to 4¾ per cent, and those not so well known 5 to 5½ per cent, and some small names at 6 per cent.

	1915.	1914.
Upriver, fine	\$0.65 @ 0.68	\$0.56 @ 0.59
Upriver, coarse
Islands, fine
Islands, coarse
Cameta

*Figured only to August 26.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and August 30, the current date:

Para.	Sept. 1, 1915.	Aug. 1, 1916.	Aug. 30, 1916.
Upriver, fine, new	57 @	66½ @	69 @
Upriver, fine, old	58 @	.....	.....
Islands, fine, new	50½ @	59 @	58 @
Islands, fine, old	52 @ 53	.....	.....

MARKET CABLE SERVICE FROM SINGAPORE.

The following reports of the weekly auctions held at Singapore have been cabled by The Waterhouse Co., Limited:

Date.	Crêpe.	Smoked Sheet.	Pounds Sold.	Market.
Aug. 4	50.1	50.1	582,400	Slightly weaker—less demand.
Aug. 11	51.4	51.8	938,560	A general and active demand.
Aug. 16	48.8	48.8	443,520	Very dull.
Aug. 24	49.7	49.7	748,160	Steady—holders are firm.

SINGAPORE.

GUTHRIE & CO., LIMITED, report [July 6, 1916]:

The weekly market finished with a good demand but a declining tendency. Fine pale crepe and ribbed smoked sheet sold at \$1.20 and \$1.19 per pound respectively. Brown crepe and the lower grades were on the average about 10 per cent lower than last week. There was a fair demand for scrap rubber. Of the 383 tons cataloged 325 tons found buyers.

The following was the price of values:

	In Singapore per piece.	Sterling equivalent per pound in London.	Equivalent per pound in cents.
Sheet, fine ribbed smoked.....	\$118.12	2 1/4 @ 2 1/2	57.27 @ 59.04
Sheet, good ribbed smoked.....	116.11	2 1/4 @ 2 1/2	53.97 @ 57.01
Sheet, plain smoked.....	114.11	2 1/4 @ 2 1/2	53.97 @ 56.00
Sheet, ribbed, unsmoked.....	100.106	2 1/2 @ 2 1/2	49.66 @ 52.20
Sheet, plain unsmoked.....	100.108	2 1/2 @ 2 1/2	51.43 @ 52.95
Crepe, pale.....	107.113	4 @ 2 1/2	50.91 @ 59.54
Crepe, good pale.....	106.110	2 1/2 @ 2 1/2	53.46 @ 58.28
Crepe, fine brown.....	104.119	2 1/2 @ 2 1/2	54.47 @ 57.77
Crepe, dark.....	107.113	1 8 @ 1 1/2	41.05 @ 49.66
Crepe, dark.....	104.110	1 3 @ 1 1/2	30.41 @ 45.35
Crepe, dark.....	104.110	1 1/2 @ 1 1/2	35.00 @ 41.05
Crepe, virgin.....	72.885	1 6 @ 1 1/2	23.75 @ 43.33
Straps, dressed.....	70.1	1 6 @ 1 1/2	36.99 @ 41.05
Straps, loose.....	55.82	1 3 @ 1 1/2	30.41 @ 41.81

*Pound = 133 1/3 pounds.

†Figured at standard rate of exchange, 1r. = 24.3 cents.

Quoted in S. S. dollars = 24 1/2 @ 25.

PLANTATION RUBBER FROM THE FAR EAST.

TOTAL EXPORTS FROM MALAYA.

(From January 1, 1916, to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	From Singapore.	From Malacca.	From Penang.	From Port Swettenham.	Totals.
United Kingdom.....	31,191.36	3,016.31	31,191.36	30,191.36	33,316.202
The Continent.....	11,664.933	1,538.534	8,955.767	11,156.968	33,316.202
Japan.....	1,767.746	1,000.000	1,000.000	1,000.000	5,767.746
Ceylon.....	131.961	1,000.000	277.333	771.219	1,180.513
United States.....	3,595.600	1,000.000	3,595.600	3,595.600	11,786.800
Australia.....	142.314	1,000.000	1,000.000	1,000.000	142.314
Totals.....	51,915.487	1,538.534	13,199.367	11,928.187	78,571.575
For same period, 1915.....	28,800.301	3,276.002	10,692.663	14,671.501	57,440.467
For same period, 1914.....	15,195.639	1,772.537	8,614.533	13,959.414	39,542.133
For same period, 1913.....	9,564.859	1,000.000	5,865.467	13,226.350	28,654.676

EXPORTS OF CEYLON RUBBER, 1916.

(From January 1 to July 1915 and 1916. Compiled by the Ceylon Chamber of Commerce.)

To—	1915.	1916.
United States.....	7,033.921	14,276.005
Canada and Newfoundland.....	340.140	424.240
France.....	223.072	854.320
Russia.....	332.200	248.874
United Kingdom.....	12,992.554	10,038.573
Australia.....	346.457	489.231
India.....	500	678
Straits Settlements.....	119.933	159.669
Japan.....	208.089	159.669
Totals.....	21,596.866	26,069.590

(Same period 1914, 17,368,591 pounds; same period 1913, 11,741,234.) The export figures of rubber, given in the above table for 1914, include the imports re-exported. (These amount to 1,784,515 pounds from the Straits Settlements and 367,511 pounds from India.) To arrive at the total quantity of Ceylon rubber exported in 1914 and deduct these imports from the total exports. The figures for 1915 and 1916 are for Ceylon rubber only.

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram from Kuala Lumpur gives the figures of the export of plantation rubber from the Federated Malay States during the month of July as 5,053 tons against 5,114 tons in June last and 3,687 tons in the corresponding month last year. The total export for seven months of the current year amounted to 32,144 tons against 22,877 tons in 1915 and 16,821 tons in 1914. Appended are the comparative statistics:

	1914.	1915.	1916.
January.....	2,542	3,473	4,240
February.....	2,364	3,411	5,207
March.....	2,418	3,418	4,429
April.....	2,151	2,772	3,914
May.....	2,069	2,708	3,956
June.....	2,306	3,403	5,114
July.....	2,971	3,687	5,053
Totals.....	16,821	22,877	32,144

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official cablegram from Singapore gives the figures of the export of plantation rubber from the Straits Settlements ports for the month of June as 3,836 tons against 3,274 tons in May and 2,249 tons in the corresponding month last year. The total export for the six months of the current year amounted to 23,612 tons against 15,609 tons in 1915 and 8,506 tons in 1914. Appended are the comparative figures:

	1914.	1915.	1916.
January.....	1,181	2,576	4,443
February.....	793	2,741	3,359
March.....	1,285	2,477	4,481

April.....	1,548	1,978	4,219
May.....	1,309	3,588	3,274
June.....	1,480	2,249	3,836
Totals.....	8,506	15,609	23,612

These figures include transshipments of rubber from various places in the neighborhood of the Straits Settlements such as Borneo, Java, Sumatra and the non-Federated Malay States as well as rubber actually exported from the Colony, but do not include rubber exports from the Federated Malay States.

IMPORTS AND EXPORTS OF RUBBER AND GUTTA AT SINGAPORE.

IMPORTS.

June, 1916.

From—	Para Rubber.	Para for Rubber Treatment.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.
Malaya, Peninsular.....	1,130,333	8,043	.....	.....	.....
Port Swettenham.....	806,000	.....	.....	.....	.....
Yok Anson.....	543,466	.....	.....	.....	.....
Muar.....	75,556	.....	.....	.....	.....
Port Dickson.....	54,000	18,533	.....	.....	.....
Kelantan.....	32,000	.....	.....	.....	.....
Kuantan.....	7,600	.....	.....	.....	.....
Rengit.....	2,666	.....	.....	.....	.....
Talang.....	1,133	.....	.....	.....	.....
Metsing.....	.....	.....	.....	.....	.....
Totals.....	2,652,794	27,466	.....	.....	.....

Borneo—					
Pontianak.....	67,533	3,731	11,466	2,000	41,230
Sarawak.....	54,133	17,466	.....	7,333	614,266
Jessellton.....	49,743	289,066	266	2,800	.....
Sibu.....	32,000	.....	400	3,333	155,466
Bandjermasin.....	25,800	52,666	.....	111,300	143,730
Lahau.....	9,700	1,200	133	3,600	91,066
Sungai.....	533	.....	.....	2,666	.....
Kudat.....	17,600	14,666	.....	.....	.....
Sandakan.....	16,666	30,400	.....	656	.....
Paser.....	1,466	.....	.....	.....	.....
Singawang.....	400	.....	.....	3,600	.....
Samat.....	400	.....	.....	2,000	.....
Totals.....	317,062	359,196	13,198	139,198	1,045,758

Sumatra—					
Djambi.....	207,466	.....	5,466	1,333	.....
Belawan.....	3,400	78,533	.....	.....	.....
Palembang.....	17,733	.....	2,933	96,666	.....
Deli.....	13,600	.....	.....	.....	.....
Indragiri.....	4,466	16,400	.....	133	9,603
Asahan.....	9,000	24,303	.....	.....	.....
Sialk.....	2,266	6,666	.....	.....	.....
Muntok.....	1,600	.....	.....	.....	.....
Bengkalis.....	1,166	.....	4,656	12,000	.....
Port Bon.....	.....	.....	.....	.....	.....
Totals.....	289,607	125,802	2,933	10,255	119,602

Straits Settlements—					
Penang.....	584,800	49,133	.....	.....	.....
Malacca.....	504,933	793,733	.....	.....	.....
S. Pandieng.....	2,000	.....	.....	.....	.....
Totals.....	1,091,733	1,291,866	.....	.....	.....

Java—					
Souabaya.....	130,266	.....	.....	.....	.....
Batavia.....	78,266	.....	.....	.....	.....
Totals.....	208,532	.....	.....	.....	.....

Burma					
Rangoon.....	6,800	.....	.....	.....	.....
Other Ports.....	134,133	99,333	8,266	15,733	112,800
Grand Totals.....	4,701,751	1,903,663	24,397	165,186	1,278,160

EXPORTS.

June, 1916.

To—	Para Rubber.	Para Trans-shipped.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.
NORTH AMERICA:					
United States.....	3,802,133	859,200	.....	476,400	2,635,200
New York.....	967,333	18,766	.....	126,933	1,175,700
San Francisco.....	4,133	17,866	.....	.....	37,466
Alton.....	86,766	.....	.....	.....	.....
Boston.....	4,533	.....	.....	.....	.....
Canada—					
Ontario (Toronto).....	66,666	.....	.....	.....	.....
Totals.....	5,021,064	915,332	.....	603,333	3,837,866

EUROPE:

United Kingdom—					
England—					
London.....	971,200	951,066	.....	274,133	22,933
Liverpool.....	167,066	413,333	.....	56,400	78,133
Scotland (Glasgow).....	.....	.....	.....	4,000	.....
Russia (Vladivostok).....	145,200	.....	.....	.....	.....
France (Marseilles).....	113,600	.....	.....	11,466	.....
Italy (Genoa).....	31,333	.....	.....	.....	.....
Totals.....	1,428,399	1,364,399	.....	346,399	101,066
Grand Totals.....	6,449,463	2,279,731	.....	949,732	3,938,932

CRUDE RUBBER ARRIVALS AT THE PORT OF NEW YORK.

(The Figures Indicate Weights in Pounds.)

JULY 28.—By the steamer *Francis* from Pará and Manáos:

	Fine	Medium	Coarse	Caucho	Total
Meyer & Brown	9,580	7,000	14,400	14,200	45,180
Arnold & Zeiss	95,200	8,700	26,900	17,600	148,400
H. A. Aslett & Co.	56,400	8,300	35,300	23,800	123,800
Edwards & Co.	31,200	8,400	10,600	50,300	100,500
Robinson & Co.	39,100	6,600	4,900	300	50,000
Jell & Diamond	23,800		3,300		26,100
Henderson & Korn	1,100		24,000		25,100
Aldens' Successors, Ltd.	400	9,500	13,000		22,900
G. Amsinck & Co.	5,400	700	8,800		14,500
Totals	351,800	49,200	139,900	55,300	596,200

AUGUST 2.—By the steamer *Atahualpa* from Pará and Manáos:

	Fine	Medium	Coarse	Caucho	Total
Meyer & Brown	1,100		17,900		19,000
Arnold & Zeiss	107,100				107,100
Henderson & Korn	300	2,200	16,700	12,500	31,700
H. A. Aslett & Co.	21,800				21,800
G. Amsinck & Co.	1,400		4,000		5,400
Totals	131,700	2,200	38,600	12,500	185,000

PARAS.

POUNDS.

JULY 28.—By the *Mayora*—Ciudad Bolívar:
 Yglesias, Lobo & Co. (Fine)..... 50,000
 Yglesias, Lobo & Co. (Coarse)..... 50,000
 R. Fabien & Co. (Fine)..... 4,000

AUGUST 1.—By the *Ancon*—Colon:
 G. Amsinck & Co. (Fine)..... 33,200
 G. Amsinck & Co. (Coarse)..... 3,200
 Neuss, Hessel & Co. (Fine)..... 1,500

AUGUST 5.—By the *Doctra*—Montevideo:
 Crossman & Seicklen (Caucho)..... 24,000
 A. D. Straus & Co. (Fine)..... 13,000
 Neuss, Hessel & Co. (Fine)..... 24,000
 E. Henney & Co. (Fine)..... 6,000

AUGUST 14.—By the *Crovan* of Galicia—Ciudad Bolívar:
 R. Fabien & Co. (Fine)..... 20,000
 R. Fabien & Co. (Coarse)..... 10,000
 Yglesias, Lobo & Co. (Fine)..... 12,000
 Yglesias, Lobo & Co. (Coarse)..... 5,000

AUGUST 17.—By the *Cristobal*—Colon:
 G. Amsinck & Co. (Fine)..... 26,000
 Neuss, Hessel & Co. (Fine)..... 12,000

CENTRALS.

[*This sign, in connection with imports of Centrals, denotes Guayule rubber.]

JULY 22.—By the *Carrillo*—Cartagena:
 G. Amsinck & Co..... 10,000
 Mecke & Co..... 4,000
 Caballero & Blanco..... 500

JULY 22.—By the *Advance*—Colon:
 G. Amsinck & Co..... 1,700
 H. Mann & Co..... 800
 Piza Nephews & Co..... 7,800
 Isaac Brandon & Bros..... 1,500
 Fidance Bros. & Co..... 500

JULY 24.—By the *Esperanza*—Tampico:
 C. Tennant Sons & Co..... *35,000

JULY 24.—By the *Esperanza*—Mexico:
 E. Steiger & Co..... *16,000
 American Trading Co..... *2,000
 J. A. Medina & Co..... *2,000
 L. Deschamps..... *500

JULY 24.—By the *Singala*—Puerto Barrios:
 A. Rosenthal & Sons..... 2,000
 W. H. Knox & Co..... 100
 J. S. Sembrado & Co..... 3,000

JULY 25.—By the *Tenadores*—Bocas del Toro:
 Coudrey & Co..... 3,000
 Isaac Brandon & Bros..... 1,000

JULY 26.—By the *Colon*—Colon:
 P. A. Andrade & Son..... 1,500
 Piza Nephews & Co..... 1,200
 Potberg, Ebeling & Co..... 600
 H. Marquardt & Co..... 200

JULY 27.—By the *Santa Marta*—Cartagena:
 G. Amsinck & Co..... 800
 H. W. Peabody & Co..... 400

AUGUST 1.—By the *Ata*—Colon:
 G. Amsinck & Co..... 5,600
 Mecke & Co..... 3,600
 H. Wolff & Co..... 700

AUGUST 1.—By the *Meapana*—Port Limon:
 A. A. Linde & Co..... 2,000
 Isaac Brandon & Bros..... 500
 G. Amsinck & Co..... 300

AUGUST 2.—By the steamer *Atahualpa* from Iquitos:

	Unpressed	Barik of Spanish	Unpressed	Barik of Spanish
G. Amsinck & Co.	1,500	1,500	174,000	176,500
Arnold & Zeiss	1,000	1,100	120,000	123,800
H. A. Aslett & Co.	1,700	1,600	300	29,800
W. R. Grace & Co.	3,900	400	600	7,500
Thomson & Co.	400		300	3,000
Totals	8,500	1,400	4,800	334,800

AUGUST 7.—By the steamer *Acre* from Pará and Manáos:

	Fine	Medium	Coarse	Caucho	Total
Meyer & Brown	55,300	4,400	31,300	19,500	110,500
Arnold & Zeiss	53,300	11,400	26,300	35,000	126,000
H. A. Aslett & Co.	52,800	9,300	12,000	16,200	90,300
Muller, Schall & Co.	46,000	3,900	1,700	19,300	70,500
G. Amsinck & Co.	19,800	600	5,100	8,800	34,300
W. R. Grace & Co.	19,700	2,100	1,900	35,100	58,800
Henderson & Korn	19,300		16,100	13,100	48,500
Crossman & Seicklen	27,600				27,600
Paul Berthel	100		4,700	10,400	15,200
Robinson & Co.		6,000			6,000
Lawrence Johnson & Co.		4,000			4,000
Guaranty Trust Co.	21,400		2,100	48,700	72,200
Totals	415,800	36,800	105,400	238,000	696,000

MANICOBIA.

POUNDS.

JULY 28.—By the *Gregory*—Maranhão:
 G. Amsinck & Co..... 1,200

AUGUST 3.—By the *Raeburn*—Bahia:
 Adolph Hirsch & Co..... 17,600

AUGUST 7.—By the *Acre*—Bahia:
 Adolph Hirsch & Co..... 24,000
 Lawrence Johnson & Co..... 17,500

PLANTATIONS.

JULY 24.—By the *Mongoh*—London:
 Meyer & Brown..... 6,000
 Robert Badenhop Co..... 35,500
 Raw Products Co..... 13,500
 Charles T. Wilson Co., Inc..... 80,000
 Goodyear Tire & Rubber Co..... 10,500
 E. Stern & Co..... 95,000
 Rubber Trading Co..... 17,000

JULY 25.—By the *Buenaventura*—Colombo:
 J. T. Johnstone & Co..... 30,000
 Goodyear Tire & Rubber Co..... 18,000
 Robinson & Co..... 11,000
 L. Littlejohn & Co..... 29,120
 Henderson & Korn..... 40,000

JULY 26.—By the *City of Madrid*—Colombo:
 Meyer & Brown..... 47,000
 L. Littlejohn & Co..... 4,480
 Arnold & Zeiss..... 45,000
 W. H. Stiles & Co..... 11,200
 J. T. Johnstone & Co..... 75,000
 Goodyear Tire & Rubber Co..... 38,000
 W. R. Grace & Co..... 2,200
 Charles T. Wilson Co., Inc..... 14,000
 Edward Maurer & Co., Inc..... 4,500

JULY 27.—By the *Medan*—Batavia:
 Meyer & Brown..... 90,000
 General Rubber Co..... 10,000
 Aldens' Successors, Ltd..... 99,100
 Edward Maurer & Co., Inc..... 95,000
 G. Amsinck & Co..... 20,000
 Henderson & Korn..... 70,000
 Manhattan Rubber Manufacturing Co..... 70,000
 J. T. Johnstone & Co..... 5,000
 H. H. Cone..... 30,000
 W. R. Grace & Co..... 16,000
 Stein, Hirsch & Co..... 4,000
 L. Littlejohn & Co..... 24,070
 Goodyear Tire & Rubber Co..... 97,000
 Various..... 170,000

JULY 27.—By the *Isipet*—Colombo:
 Meyer & Brown..... 85,000
 L. Littlejohn & Co..... 136,500
 Arnold & Zeiss..... 50,000
 W. R. Grace & Co..... 7,000
 Aldens' Successors, Ltd..... 11,100
 Edward Maurer & Co., Inc..... 35,000
 W. H. Stiles & Co..... 22,000
 J. T. Johnstone & Co..... 358,300

JULY 28.—By the *Faleria*—Liverpool:
 The R. F. Goodrich Co..... 4,500

JULY 31.—By the *Valodia*—London:
 Meyer & Brown..... 22,500
 The R. F. Goodrich Co..... 10,800
 L. Littlejohn & Co..... 51,446
 Arnold & Zeiss..... 60,000
 Michelin & Co..... 10,000
 Robinson & Co..... 60,000
 J. T. Johnstone & Co..... 31,000

AFRICANS.

JULY 27.—By the *Medan*—Batavia:
 Karl Schroeder..... 30,000
 Various..... 70,000

AUGUST 4.—By the *Quadr*—Liverpool:
 Goodyear Tire & Rubber Co..... 11,200
 Arnold & Zeiss..... 6,000

AUGUST 7.—By the *Redia*—Batavia:
 General Rubber Co..... 85,000
 Karl Schroeder..... 40,000
 Various..... 15,000

AUGUST 4.—By the *Cedric*—Liverpool:
 Meyer & Brown..... 45,000

AUGUST 7.—By the *Ordina*—Liverpool:
 Adolph Hirsch & Co..... 190,000

AUGUST 14.—By the *Queen Margaret*—Liverpool:
 Arnold & Zeiss..... 33,500

AUGUST 1.—By the *Tagadine*—Lisbon:
 Various..... 22,500

AUGUST 22.—By the *Syrmia*—Liverpool:
 Goodyear Tire & Rubber Co..... 11,200

AUGUST 22.—By the *Lord Grey*—Liverpool:
 Goodyear Tire & Rubber Co..... 11,200

Charles T. Wilson Co., Inc. 11,000 606,146

JULY 31.—By the <i>Lebanon</i> —London		
Meyer & Brown.....	50,000	
Edward Maurer & Co., Inc.....	205,000	
General Rubber Co.....	50,000	
J. T. Johnstone & Co.....	50,000	
L. Littlejohn & Co.....	489,015	
Arnold & Zeiss.....	12,000	
The B. F. Goodrich Co.....	18,000	
Henderson & Korn.....	12,000	
Goodyear Tire & Rubber Co.....	112,000	
F. W. Curry.....	22,500	
W. R. Grace & Co.....	18,000	
H. R. Jefferys.....	11,700	
Robinson & Co.....	12,500	
Aldens' Successors, Ltd.....	72,000	
Charles T. Wilson Co., Inc.....	42,500	
Rubber Trading Co.....	18,000	
Fisk Rubber Co.....	11,200	
Raw Products Co.....	7,000	2,843,515

AUGUST 1.—By the <i>Panama</i> —London		
Victrola Tire Co.....	50,000	
Arnold & Zeiss.....	67,000	
Charles T. Wilson Co., Inc.....	11,200	
Robinson & Co.....	9,000	
L. Littlejohn & Co.....	9,570	152,570

AUGUST 3.—By the <i>Havanna</i> —London		
Raw Products Co.....	56,000	
W. R. Grace & Co.....	18,000	
J. T. Johnstone & Co.....	8,000	73,000

AUGUST 3.—By the <i>Radja</i> —Batavia		
Meyer & Brown.....	100,000	
Edward Maurer & Co., Inc.....	390,000	
Goodyear Tire & Rubber Co.....	95,000	
J. T. Johnstone & Co.....	65,000	
Manhattan Rubber Manufacturing Co.....	50,000	
W. R. Grace & Co.....	30,000	
Stein, Hirsch & Co.....	30,000	
G. Amminck & Co.....	30,000	
General Rubber Co.....	10,000	
L. Littlejohn & Co.....	79,900	
Arnold & Zeiss.....	9,000	
Rubber Trading Co.....	2,000	
Aldens' Successors, Ltd.....	4,400	
Various.....	150,000	1,006,309

AUGUST 5.—By the <i>Andania</i> —London		
Meyer & Brown.....	45,000	
The B. F. Goodrich Co.....	18,000	
J. T. Johnstone & Co.....	12,000	
Arnold & Zeiss.....	12,000	
Charles T. Wilson Co., Inc.....	33,500	
General Rubber Co.....	90,000	
Robinson & Co.....	10,000	
L. Littlejohn & Co.....	9,148	321,148

AUGUST 9.—By the <i>Minnesota</i> —London		
Goodyear Tire & Rubber Co.....	80,000	
F. Stern & Co.....	80,000	160,000

AUGUST 12.—By the <i>Manchuria</i> —London		
Meyer & Brown.....	90,000	
Rubber Trading Co.....	11,200	
Charles T. Wilson Co., Inc.....	115,000	
J. Stern & Co.....	12,800	
G. R. Hendel & Co., Inc.....	16,000	
L. Littlejohn & Co.....	62,123	
W. R. Grace & Co.....	45,000	361,823

AUGUST 15.—By the <i>Blaumenheim</i> —Singapore		
Meyer & Brown.....	7,000	
Aldens' Successors, Ltd.....	14,000	
Henderson & Korn.....	320,000	
Charles T. Wilson Co., Inc.....	4,500	
Goodyear Tire & Rubber Co.....	105,000	
Robinson & Co.....	30,000	
Edward Maurer & Co., Inc.....	70,000	
J. T. Johnstone & Co.....	216,000	
L. Littlejohn & Co.....	374,482	
Arnold & Zeiss.....	205,000	
General Rubber Co.....	325,000	
The B. F. Goodrich Co.....	120,000	
F. W. Curry.....	110,000	
E. J. Curry.....	25,000	1,925,982

AUGUST 15.—By the <i>Ceylon Delta</i> —Colombo		
Meyer & Brown.....	150,000	
L. Littlejohn & Co.....	135,520	
Goodyear Tire & Rubber Co.....	54,000	
Arnold & Zeiss.....	50,000	
W. H. Stiles & Co.....	15,500	
Henderson & Korn.....	40,000	
J. T. Johnstone & Co.....	35,000	
Robinson & Co.....	9,000	507,020

AUGUST 16.—By the <i>Philadelphia</i> —London		
Rubber Trading Co.....	6,000	

AUGUST 21.—By the <i>Michigan</i> —London		
Goodyear Tire & Rubber Co.....	135,000	
Rubber Trading Co.....	35,000	
J. T. Johnstone & Co.....	5,000	
Raw Products Co.....	25,500	227,500

August 21. By the *Ceylon Delta*—Colombo

Colombo:		
Meyer & Brown.....	134,000	
L. Littlejohn & Co.....	38,000	
Robinson & Co.....	11,200	
J. T. Johnstone & Co.....	70,000	
W. R. Grace & Co.....	2,000	
Edward Maurer & Co., Inc.....	25,000	
Charles T. Wilson Co., Inc.....	16,000	
W. H. Stiles & Co.....	60,000	356,280

August 22.—By the <i>Havanna</i> —London		
Meyer & Brown.....	11,500	
Rubber Trading Co.....	30,000	
Raw Products Co.....	30,000	
Charles T. Wilson Co., Inc.....	30,000	101,500

CRUDE RUBBER ARRIVALS AT SEATTLE.

Importance is given first, followed by shippers.
Figured 130 pounds net to the case.

PLANTATION.

TOWNS.

TO SAN FRANCISCO.

JULY 22.—By the steamer <i>Bankoku Maru</i> .		
W. R. Grace & Co.....	11,500	
Damasa (Selangor) Rubber Co., Inc.....	8,060	
Goodyear Tire & Rubber Co.....		
Planters Stores & Agency Co., Ltd.....	4,420	12,480

TO AKRON.

August 6.—By the steamer <i>Laion</i> .		
Firestone Tire & Rubber Co.....	90,000	
Goodyear Tire & Rubber Co.....		
Harrisons & Crosfield.....	249,730	
Rubber Estates of Johore, Ltd.....	60,450	
Duff Development Co.....	16,510	
Langkat Sumatra Rubber Co.....	6,240	
Anglo Sumatra Rubber Co.....	5,330	
Tamiam Rubber Estates.....	3,380	
Handa Sumatra Rubber Co.....	2,080	
Serdang Central Plantation.....	1,690	437,580
Glen Herrie Rubber Co.....		

TO NEW YORK.

United States Rubber Co.		
General Rubber Co.....	59,930	
J. T. Johnstone & Co.....		
Duff Development Co.....	7,930	
Henderson & Korn.....		
Sealing Rubber Estates.....	4,290	
L. Littlejohn & Co.....		
C. W. Mackie & Co.....	119,340	
W. H. Stiles & Co.....	83,850	
C. W. Mackie.....		
C. W. Mackie.....	65,910	
Arthur Meyer & Co.....		
Duff Development Co.....	8,320	
Anglo Sumatra Rubber Co.....	2,400	
Robinson & Co.....		
Hardar Sumatra Rubber Co.....	3,380	
Serdang Central Plantation.....	3,380	
F. Stern & Co.....		
Kennedy & Co.....	3,250	362,441

TO SEATTLE.

Henderson & Korn.		
East Asiatic Co.....	16,250	
Goodyear Tire & Rubber Co.....		
C. W. Mackie & Co.....	105,820	
W. R. Grace & Co.....		
R. T. Reid & Co.....	12,610	
Chester Carcase & Co.....	11,180	
Planters Stores & Agency Co., Ltd.....	9,100	
Whitehall & Co.....	4,450	
Sandilands, Buttery & Co.....	3,640	
Chern Rubber Co.....	2,470	
Sungei Puren Rubber Co.....	2,470	530,430

TO SAN FRANCISCO.

August 18.—By the steamer <i>Shidzuka Maru</i> .		
W. R. Grace & Co.....		
Sandilands, Buttery & Co.....	24,960	

TO SEATTLE.

August 19.—By the steamer <i>Empress of Russia</i> .		
Goodyear Tire & Rubber Co.....		
C. W. Mackie & Co.....	55,250	

GUTTA JELUTONG.

TO SAN FRANCISCO.

JULY 22.—By the steamer <i>Bankoku Maru</i> .		
Boyers Rubber Works.....		
Katz Bros.....	11,700	

CUSTOM HOUSE STATISTICS.

PORT OF DETROIT—JULY, 1916.

IMPORTS.		EXPORTS.	
Number of cases.....	112,463	Value.....	\$6,825
EXPORTS:			
Rubber scrap.....	7,114	8603	
Reclaimed rubber.....	10,025	1,542	
India rubber boots.....pairs	1,791	4,335	
India rubber shoes.....pairs	156	219	
Automobile tires.....		1,422	
Other rubber tires.....		853	
Beltine, hose, etc.....			
India rubber.....		4,438	
Total.....		\$11,395	

PORT OF NEW YORK—JUNE, 1916.

IMPORTS.		EXPORTS.	
India rubber.....	26,427,917	\$16,082,190	
Balata.....	165,499	64,830	
Gutta percha.....	296,415	42,686	
Gutta jelutong (Pontianak).....	2,389,693	121,995	
Manufactures of india rubber.....		40,509	
Totals.....	29,279,527	\$16,352,210	

EXPORTS:		IMPORTS:	
India rubber.....	2,804	\$1,582	
Balata.....	36,800	20,000	
Rubber scrap.....	242,675	32,907	
Reclaimed rubber.....	41,635	6,816	
Gutta jelutong (Pontianak).....	56,000	2,520	
India rubber boots.....pairs	6,676	14,075	
India rubber shoes.....pairs	68,557	36,789	
Automobile tires.....		755,308	
Other rubber tires.....		186,134	
Beltine, hose, etc.....		269,198	
All other manufactures of india rubber.....		524,598	
Total.....		\$1,780,105	

PORT OF BOSTON—JULY, 1916.

IMPORTS:		EXPORTS:	
India rubber.....	112,378	\$67,829	
Manufactures of india rubber.....		2,763	
Rubber scrap.....	11,960	1,063	
Totals.....	124,338	\$71,655	
EXPORTS:		IMPORTS:	
Rubber scrap.....	54,438	\$5,377	
India rubber boots.....pairs	20,810	41,708	
India rubber shoes.....pairs	132,455	56,093	
Automobile tires.....		22,480	
Other rubber tires.....		76	
Beltine, hose, etc.....		4,089	
All other manufactures of india rubber.....		48,434	
Total.....		\$178,257	

PORT OF CHICAGO—JULY, 1916.

IMPORTS:		EXPORTS:	
Manufactures of india rubber.....		\$26	

PORT OF CLEVELAND—JULY, 1916.

IMPORTS:		EXPORTS:	
India rubber.....	387,596	\$266,075	
Manufactures of india rubber.....		1,809	
Totals.....	387,596	\$268,784	

PORT OF DETROIT—JULY, 1916.

IMPORTS:		EXPORTS:	
Manufactures of india rubber.....		\$7,689	
Rubber scrap.....	94,296	6,756	
Totals.....	94,296	\$14,445	

EXPORTS:		IMPORTS:	
Rubber scrap.....	878	\$55	
Reclaimed rubber.....	23,830	4,206	
India rubber boots.....pairs	2,232	5,247	
India rubber shoes.....pairs	42	99	
Automobile tires.....		14,794	
Beltine, hose, etc.....		1,759	
All other manufactures of india rubber.....		5,154	
Total.....		\$31,314	

PORT OF NEW ORLEANS—JULY, 1916.

IMPORTS:		EXPORTS:	
India rubber.....	16,467	\$5,686	
PORT OF PHILADELPHIA—JULY, 1916.			
IMPORTS:		EXPORTS:	
Beltine, hose, etc.....		\$2,317	
Other manufactures of india rubber.....		6,150	
Total.....		\$8,467	

IMPORTS AND EXPORTS OF CRUDE AND MANUFACTURED RUBBER AT THE PORT OF NEW YORK.

IMPORTS.

Week Ending—	India Rubber.		Scrap for Re-manufacture.		Balata.		Gutta Percha.		Chebe.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
July 21, 1916.....	2,375,917	\$4,342	208,313	\$13,816	60,272	\$30,233	.....	.....	.....	.....
July 28, 1916.....	.....	1,552	.....	.....	.....	.....	.....	6,540	.....	.....
August 4, 1916.....	2,566,681	1,548,007	30,223	2,445	37,344	12,917	11,191	894	36,857	22,277
August 11, 1916.....	5,500,170	3,233,038	299,635	23,750	14,401	7,164	390,607	47,268	.....	.....
August 18, 1916.....	.....	17,198	194,535	12,851	13,973	4,542	.....	2,810	.....	.....
August 25, 1916.....	3,606,634	2,017,219	1,472	.....	.....	.....	.....	11,550	.....	.....
.....	2,462,051	821,335	80,995	8,453	.....	6,866	89,600	8,705	.....	.....

*Pounds not specified.

EXPORTS.

FIGURES ISSUED FROM JULY 25, 1916, TO AUGUST 24, 1916.

EXPORTED TO	Belting, Hose and Packing.	Footwear.		Tires.		Insulated Wire and Cables.	Other mfr.	Fountain Pens.	Chewing Gum.	Reclaimed Rubber.	Scrap Rubber.
		Boots.	Shoes.	Auto.	Other.						
NORTH AMERICA:											
Bermuda.....	.....	.....	537	114	3140	.....	\$589	.....	\$47	\$143	.....
British Honduras.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Canada.....	74	.....	1,116	.....	.....	.....	903	.....	.....	.....	.....
Central American States—											
Costa Rica.....	445	.....	.....	358	77	116	804	.....	.....	234	.....
Guatemala.....	289	.....	.....	104	.....	.....	975	.....	.....	25	.....
Honduras.....	.....	.....	1,641	.....	.....	88	405	.....	.....	.....	.....
Nicaragua.....	299	.....	.....	.....	.....	.....	1,953	.....	.....	.....	.....
Panama.....	7,177	.....	1,762	5,065	1,266	26,214	6,816	6	1,509	.....	.....
Salvador.....	177	.....	.....	719	.....	149	558	.....	.....	.....	.....
Mexico.....	2,664	.....	.....	8,996	1,460	2,415	2,676	.....	.....	.....	.....
Newfoundland.....	16	\$1,213	10,698	1,348	17	2,871	1,556	140	4	.....	.....
West Indies—											
British.....	26	.....	.....	694	4	30	197	.....	.....	4	.....
Bahamas.....	1,010	3	62	21,022	718	647	1,107	3	.....	.....	.....
Trinidad and Tobago.....	1,456	.....	.....	2,875	119	1,601	1,601	.....	.....	.....	.....
Other British.....	299	.....	30	2,105	437	661	625	4	20	.....	.....
Cuba.....	32,372	.....	174	113,362	139,553	14,809	36,795	836	1,394	.....	.....
Dutch.....	.....	.....	123	87	.....	.....	.....	.....	.....	.....	.....
French.....	11	.....	60	3	225	47	.....	.....	.....	.....	.....
Haiti.....	356	.....	40	299	1,111	19	.....	.....	.....	.....	.....
Santo Domingo.....	78	.....	6	6	90	942	253	112	44	.....	.....
Totals, North America.....	\$49,076	\$1,216	\$17,069	\$159,879	\$145,442	\$49,777	\$57,585	\$1,149	\$3,399	.....	.....
EUROPE:											
Denmark.....	773	.....	.....	1125	831	.....	\$674	.....	.....	.....	.....
France.....	18,24	.....	11,099	15,909	42,890	\$39,413	66,287	.....	\$3,900	.....	\$5,950
Greece.....	2,012	.....	.....	5,600	.....	980	.....	.....	.....	.....	.....
Italy.....	536	.....	3,528	14,521	12,205	3,633	14,099	\$40	.....	.....	.....
Netherlands.....	8,165	.....	878	.....	1,012	17,495	4,703	600	.....	.....	.....
Norway.....	1,634	.....	.....	.....	.....	1,539	.....	.....	.....	.....	.....
Portugal.....	.....	.....	80	.....	.....	83	169	.....	260	.....	.....
Russia in Europe.....	255	.....	.....	.....	.....	4,467	1,830	49	.....	.....	.....
Spain.....	.....	.....	.....	.....	.....	58,172	70	525	.....	.....	.....
Sweden.....	.....	.....	.....	.....	.....	.....	385	.....	.....	.....	.....
Switzerland.....	10	.....	.....	.....	.....	.....	692	.....	.....	.....	.....
United Kingdom—	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
England.....	43,004	\$800	49,343	194,188	129,793	49,480	313,524	658	28,164	\$12,815	8,885
Scotland.....	7,980	.....	2,343	.....	572	.....	548	66	293	.....	.....
Totals, Europe.....	\$65,484	\$800	\$67,183	\$228,423	\$187,303	\$196,681	\$405,312	\$1,107	\$32,617	\$12,815	\$14,635
SOUTH AMERICA:											
Argentina.....	\$8,015	.....	\$1,000	\$58,621	\$1,227	\$14,947	\$39,992	\$279	\$816	\$678	.....
Bolivia.....	.....	.....	.....	1,048	.....	.....	125	.....	.....	.....	.....
Brazil.....	5,606	\$69	994	5,890	3,772	26,439	15,133	1,042	19	.....	.....
Chile.....	57,153	151	285	27,835	2,430	40,111	16,252	.....	266	.....	.....
Colombia.....	475	.....	305	4,440	877	1,196	3,100	.....	.....	.....	.....
Ecuador.....	2,176	.....	.....	761	474	940	460	.....	41	.....	.....
Guiana—British.....	209	.....	349	27	152	84	185	.....	28	.....	.....
Dutch.....	.....	.....	.....	.....	.....	.....	83	.....	.....	.....	.....
French.....	.....	.....	.....	35	.....	.....	27	.....	.....	.....	.....
Paraguay.....	.....	.....	.....	1,530	268	4,815	4,227	.....	97	.....	.....
Peru.....	3,415	1,505	.....	2,578	1,067	10,208	2,848	.....	.....	.....	.....
Uruguay.....	3,853	.....	239	2,578	1,067	10,208	2,848	.....	.....	.....	.....
Venezuela.....	1,198	.....	.....	8,368	2,177	3,141	3,534	.....	52	.....	.....
Totals, South America.....	\$82,100	\$1,725	\$2,772	\$111,085	\$13,477	\$95,949	\$85,930	\$1,348	\$1,319	\$678	.....
ASIA:											
China.....	842	.....	.....	\$1,287	.....	55,974	854	.....	\$163	.....	.....
British India.....	1,325	.....	113	2,034	\$1,248	58	2,660	693	\$344	.....	.....
Straits Settlements.....	43	.....	12	276	.....	.....	270	.....	.....	.....	.....
Dutch East Indies.....	656	.....	.....	12,356	.....	4,320	2,908	.....	.....	.....	.....
Hongkong.....	19	.....	.....	.....	125	.....	10	88	.....	.....	.....
Japan.....	513	\$89	1,308	.....	36	3,885	221	.....	.....	\$2,904	.....
Russia in Asia.....	.....	.....	.....	.....	141	.....	.....	.....	.....	.....	.....
Siam.....	.....	.....	.....	116	.....	.....	16	.....	.....	.....	.....
Totals, Asia.....	\$2,588	\$89	\$1,443	\$10,059	\$2,203	\$14,237	\$6,159	\$944	\$344	\$2,904	.....
OCEANIA:											
British—	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Australia and Tasmania.....	195	.....	.....	\$9,016	\$2,487	\$3,633	\$12,156	\$180	\$1,868	\$9,258	\$963
New Zealand.....	1,152	.....	1,623	6,166	5,534	12,739	174,105	.....	.....	.....	.....
Philippine Islands.....	299	.....	8,986	6,863	512	814	4,056	.....	600	.....	.....
British Oceania.....	.....	.....	287	.....	.....	.....	.....	.....	.....	.....	.....
Totals, Oceania.....	\$1,546	.....	\$19,324	\$22,045	\$8,533	\$17,186	\$195,317	\$180	\$2,468	\$9,258	\$963
AFRICA:											
British Africa—	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West.....	\$80	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South.....	50,840	.....	\$237	\$34	\$52,281	\$25,655	\$3,367	9,358	.....	\$291	\$151
East.....	.....	.....	.....	2,978	1,572	.....	.....	.....	.....	.....	.....
Egypt.....	70	.....	.....	261	.....	.....	.....	13	.....	.....	.....
French Africa.....	145	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Madagascar.....	706	.....	.....	.....	.....	.....	.....	25	.....	.....	.....
Portuguese Africa.....	1,856	.....	.....	.....	.....	.....	319	.....	.....	.....	.....
Totals, Africa.....	\$53,697	\$237	\$295	\$55,259	\$27,227	\$3,367	\$10,142	\$38	\$291	.....	\$151

EXPORTS OF INDIA RUBBER FROM MANAOS DURING JUNE, 1916.

NEW YORK.

EUROPE.

EXPORTERS	Fine.	Medium.	Coarse.	Caucho.	TOTAL.	Fine.	Medium.	Coarse.	Caucho.	TOTAL.	GRAND TOTAL.
Suter & Co.	3,790	3,018	28,641	10,377	45,826	21,847	760	2,348	98,589	118,534	196,362
General Rubber Co. of Brazil.	2,778	34,192	1,439	3,556	42,965	21,980	1,106	1,106	36,198	103,357	146,323
Tancredi Porto & Co.	39,669	12,388	30,004	3,655	86,005	5,901	8,313	1,391	31,068	66,643	152,648
J. G. Adams	33,015	3,903	13,717	21,542	72,177	160	840	22,200	23,900	96,671	95,377
Adelbert H. Alden, Ltd.	.....	340	1,080	.....	1,420	.....	.....	.....	35,651	36,071	38,091
H. Badling	10,311	.....	.....	9,902	20,304	.....	.....	.....	.....	.....	20,304
Armazens Andressen	5,191	1,000	495	4,443	11,129	.....	.....	.....	.....	.....	10,162
C. Fraiz	3,840	.....	.....	.....	3,840	.....	.....	.....	.....	.....	3,840
Mesquita & Co.	.....	.....	.....	.....	.....	.....	160	400	160	720	720
TOTALS	193,134	22,947	88,415	102,665	377,181	50,958	69,676	9,035	228,956	349,625	726,806
May, 1916	190,344	69,135	142,723	280,793	923,195	28,635	29,243	17,539	198,313	273,730	1,196,925
April, 1916	14,437	48,556	168,393	37,704	929,300	21,682	5,835	35,419	252,036	550,692	1,478,992
March, 1916	50,353	76,236	228,580	320,482	1,127,621	450,320	87,079	49,033	318,648	907,036	2,032,651
February, 1916	516,003	82,739	191,537	205,419	1,025,698	164,300	27,819	56,344	119,229	367,792	1,393,490
January, 1916	561,143	110,411	176,779	148,142	996,475	54,826	58,574	75,105	123,703	801,204	1,797,679

EXPORTS OF INDIA RUBBER FROM MANAOS FROM JANUARY TO JUNE, 1916.

NEW YORK.

EUROPE.

EXPORTERS	Fine.	Medium.	Coarse.	Caucho.	TOTAL.	Fine.	Medium.	Coarse.	Caucho.	TOTAL.	GRAND TOTAL.
Suter & Co.	356,272	31,010	150,715	175,560	713,557	148,345	16,597	3,606	242,560	412,108	1,125,665
General Rubber Co. of Brazil.	489,995	91,260	234,469	331,563	1,147,287	217,773	112,420	25,871	275,250	640,714	1,778,937
Pralow & Co.	365,393	43,187	116,396	91,888	616,864	317,531	25,089	62,666	153,782	559,028	1,177,892
Tancredi Porto & Co.	270,076	89,254	143,728	142,234	645,292	177,811	100,284	40,251	105,747	424,093	1,069,385
J. G. Adams	459,738	55,987	36,997	72,629	635,351	111,881	10,584	35,566	35,447	258,452	691,143
Armazens Andressen	458,298	34,034	88,086	166,313	646,731	94,941	10,584	35,566	35,447	258,452	691,143
Adelbert H. Alden, Ltd.	308	25,878	37,398	6,055	70,079	14,247	7	16	274,320	416,638	486,737
Gaspar Almeida & Co.	35,466	4,281	14,250	23,801	78,178	.....	.....	.....	.....	78,178	78,178
Jose Carneiro de Mota	32,082	2,617	17,814	2,963	55,476	7,646	.....	.....	.....	7,646	63,162
H. Badling	35,961	.....	.....	24,069	60,030	449	228	67	.....	744	63,804
Simfionio & Co.	31,200	5,159	11,806	1,101	49,366	5,140	2,827	3,065	118	11,150	60,516
Semper & Co.	32,082	2,617	17,814	2,963	55,476	7,646	.....	.....	.....	7,646	63,162
Armazens Imass	800	300	3,000	3,750	7,850	29,182	4,000	2,416	3,276	35,874	43,724
Obliger & Co.	31,824	13	20	.....	51,907	1,819	.....	.....	.....	1,819	51,907
Meyers	3,900	400	400	100	5,600	.....	.....	.....	.....	5,600	5,600
B. Levy & Co.	11,553	2,409	3,636	18,616	35,914	3,400	160	1,583	5,146	7,068	47,988
M. Lugo	1,070	1,070	1,070	9,256	12,466	2,957	.....	.....	.....	2,957	39,403
Stovell & Sons	.....	.....	.....	685	685	.....	.....	.....	.....	685	685
Coutinho & Co.	1,160	.....	4,500	1,920	7,580	1,950	1,126	911	18,386	23,560	34,675
C. Fraiz	3,840	.....	.....	.....	3,840	.....	.....	.....	.....	3,840	3,840
Sundries	86,929	8,160	33,961	54,683	183,733	50,676	6,872	21,933	26,856	111,941	295,644
TOTALS	411,779	88,585	953,641	1,130,185	1,880,131	1,366,840	300,440	214,751	1,145,014	3,025,045	7,905,176
In transit, liquidated	13,784	26,439	42,786	308,170	502,179	83,977	13,436	27,274	96,821	220,408	728,587
TOTALS	2,537,504	410,024	996,427	1,438,355	5,382,310	1,450,817	313,896	242,475	1,240,885	3,248,073	8,630,383

(Compiled by Suter & Co., Manaus.)

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—CRUDE		May, 1916.		Eleven Months Ending May, 1916.	
	Pounds.	Value.		Pounds.	Value.
India rubber:					
From France	53,755	\$40,342		478,059	\$888,601
Portugal	23,847	9,196		2,768,293	1,092,494
United Kingdom	6,619,239	5,060,600		64,137,873	42,511,706
Central America and British Honduras.	127,423	61,015		1,170,689	530,313
Mexico	100,606	46,922		3,076,305	1,171,689
Brazil	4,626,075	2,191,894		50,135,881	22,886,831
Other South America	728,657	357,419		5,704,882	2,614,400
East Indies	14,446,445	10,052,657		109,302,400	64,889,041
Other countries	24,138	19,090		657,048	459,604
Totals	26,550,185	\$17,849,135		237,436,473	\$136,444,569
Latex	75,062	33,855		2,378,907	931,272
Guayule gum	350,520	95,409		2,509,890	789,769
Gutta percha	977,000	56,825		2,298,371	1,060,647
Gutta seringa	499,463	12,585		3,365,261	261,983
Totals	28,451,890	\$18,057,809		247,589,258	\$139,388,240

Totals		\$18,057,809	\$247,589,258
Rubber scrap	1,685,286	147,887	15,643,153
Totals, unmanufactured	30,137,176	\$18,205,696	\$263,232,411
MANUFACTURED— <i>durable</i>			
Chicle	523,361	\$230,862	\$2,541,846
MANUFACTURED— <i>not durable</i>			
Gutta percha		\$0,569	\$33,776
India rubber		37,306	341,573
Totals, manufactured		\$57,875	\$375,343
Substrates elastic, etc.		\$276	\$15,444

EXPORTS OF DOMESTIC MERCHANDISE.

MANUFACTURED—	May, 1916.		Eleven Months Ending May, 1916.	
	Pounds.	Value.	Pounds.	Value.
Automobile tires:				
To Russia in Europe*	\$8,230	.....	\$1,124,500
England	1,105,744	.....	8,511,709
Canada	89,578	.....	1,088,856

MANUFACTURED—	May, 1916.		May, 1916.	
	Pounds.	Value.	Pounds.	Value.
Automobile tires:				
Mexico		18,365		226,039
Cuba		89,731		494,863
Australia		190,911		1,442,839
New Zealand		180,532		898,149
Philippine Islands		63,896		355,040
Other countries		278,455		2,477,509
TOTALS		\$1,001,442		\$16,619,504
All other tires		449,883		2,803,548
Belting, hose, and packing		267,435		1,258,858
Rubber boots	66,731	668,846		1,552,468
Rubber shoes	165,197	95,218	1,805,410	262,488
Scrap and old rubber	791,492	39,378	4,165,145	380,159
Reclaimed rubber	472,748	68,682	6,041,679	824,642
Other rubber manufactures				

EXPORTS OF FOREIGN MERCHANDISE.

UNMANUFACTURED—	May, 1916.		Eleven Months Ending May, 1916.	
	Pounds.	Value.	Pounds.	Value.
Balata	203,550	\$55,381	330,111	\$225,770
Guayule gum .....	.....	.....	18,500	.....
Gutta perbung .....	.....	.....	2,773	305
Gutta seringa .....	.....	.....	60,023	11,446
India rubber	354,486	194,469	4,366,428	2,506,780
Rubber scrap and refuse .....	.....	.....	9,204	.....
Totals, unmanufactured, ..	558,036	\$249,850	5,087,039	\$2,752,176
MANUFACTURED—			111,638	\$42,801
Gutta percha .....	.....	.....	.....	\$437
India rubber .....	.....	\$65	.....	\$7,187
Totals, manufactured, ....	.....	\$65	.....	\$37,224

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

	May, 1916.		Eleven Months Ending May, 1916.	
	Pounds.	Value.	Pounds.	Value.
To Alaska:				
Belting, hose and packing	.....	\$13,094	.....	\$170,496
Boots and shoes, pairs	10,776	33,363	68,507	179,793
Other rubber goods	.....	6,151	.....	35,778
Totals	.....	\$52,608	.....	\$336,067
To Hawaii:				
Belting, hose and packing	.....	\$6,416	.....	\$84,229
Automobile tires	.....	48,308	.....	489,584
Other tires	.....	11,429	.....	74,820
Other rubber goods	.....	9,729	.....	82,318
Totals	.....	\$75,882	.....	\$730,951
To Philippine Islands:				
Belting, hose and packing	.....	\$4,949	.....	\$56,056
Boots and shoes, pairs	.....	156	.....	15,005
Tires	.....	6,011	.....	368,046
Other rubber goods	.....	93,647	.....	238,465
Totals	.....	\$104,916	.....	\$677,572
To Porto Rico:				
Belting, hose and packing	.....	\$3,632	.....	\$38,006
Automobile tires	.....	34,528	.....	366,832
Other tires	.....	469	.....	29,509
Other rubber goods	.....	5,966	.....	63,591
Totals	.....	\$64,595	.....	\$498,338

*Not separately stated prior to January 1, 1916.

FOR QUARTER ENDING MARCH 31, 1916.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	Jan. 1, to Mar. 31, 1916.	
	Pounds.	Value.
Unmanufactured—free:		
Balata, crude	716,470	\$297,565
Guayule, gum	523,476	154,482
Gutta jelutong	4,505,523	234,865
Gutta percha, crude	584,998	64,868
India rubber, crude	70,675,749	43,971,771
Serap rubber	4,352,256	326,150
Reclaimed rubber	588,785	78,047
Totals	81,955,557	\$45,127,748
Manufactured—dutiable:		
Gutta percha	10 per cent	\$2,276
India rubber	10 per cent	107,921
Druggists' sundries of rubber	15 per cent	6,230
Hard rubber	25 per cent	1,772
Substitutes, elastic, etc.	15 per cent	5,322
Totals	.....	\$124,013
Chicle: Crude	752,592	\$239,451
Refined	572,791	340,290
Totals	1,325,383	\$579,741

RUBBER STATISTICS FOR CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	May, 1916.		Two Months Ending May, 1916.	
	Pounds.	Value.	Pounds.	Value.
Unmanufactured—free:				
Rubber and gutta percha, crude				
Cauchoouc or India rubber:				
From Great Britain	428,511	\$298,172	1,070,245	\$781,119
United States	353,187	217,757	780,893	499,114
Straits Settlements	.....	.....	33,849	21,607
Other countries	2,217	1,891	2,217	1,891
Totals	785,917	\$517,820	1,887,204	\$1,303,731
Rubber, re-covered:				
From Great Britain	18,740	\$3,610	18,740	\$3,610
United States	368,398	\$2,449	722,354	106,309
Totals	407,138	\$56,059	741,094	\$109,919
Hard rubber, in sheets and rods:				
From United States	1,217	\$1,027	1,628	\$1,400
Rubber substitute:				
From United States	59,256	\$5,300	130,103	\$11,354
Rubber, powdered, and rubber or gutta percha waste:				
From Great Britain	81,052	\$5,274	81,052	\$5,274
United States	178,217	18,819	381,569	27,512
Other countries	1,075	34	3,928	168
Totals	260,344	\$24,147	466,549	\$32,954
Rubber thread, not covered:				
From United States	5,014	\$7,676	9,332	\$14,220
Balata, crude:				
From United States	2,426	\$1,797	2,476	\$1,797

	May, 1916.		Two Months Ending May, 1916.	
	Pounds.	Value.	Pounds.	Value.
Unmanufactured—free:				
Chicle, crude:				
From United States	932	\$324	18,988	\$7,727
British Honduras	\$47,758	201,504	764,878	282,010
Mexico	161	90	161	90
Totals	\$48,851	\$201,918	784,027	\$289,827
Manufactured—dutiable:				
Waterproof clothing:				
From Great Britain	88	\$26,137	88	\$49,041
United States	28,895	.....	49,419	.....
Totals	\$28,903	\$26,137	\$49,427	\$49,041
Hose, lined with rubber:				
From United States	\$10,857	.....	\$17,729	.....
Mats and matting:				
From Great Britain	.....	\$9	.....	\$9
United States	\$238	.....	\$991	.....
Totals	\$238	\$9	\$991	\$9
Lacking:				
From Great Britain	.....	\$4	.....	\$4
United States	\$8,700	.....	\$14,164	.....
Totals	\$8,700	\$4	\$14,164	\$4
Tires of rubber for all vehicles:				
From Great Britain	\$1,383	\$3,423	\$3,214	\$4,860
United States	119,649	.....	169,881	.....
France	617	.....	617	.....
Other countries	87	.....	87	.....
Totals	\$121,736	\$3,423	\$173,799	\$4,860
*Rubber cement, and all other manufactures of India rubber and gutta percha, N. O. P.:				
From Great Britain	\$595	\$26,609	\$914	\$49,313
United States	70,635	.....	136,681	.....
Other countries	299	.....	401	.....
Totals	\$71,547	\$26,609	\$137,354	\$49,313
Hard rubber, in tubes:				
From United States	\$848	.....	\$923	.....
Boots and shoes:				
From Great Britain	.....	\$73	.....	\$493
United States	\$10,607	.....	\$15,618	.....
Totals	\$10,607	\$73	\$15,618	\$493
Belting:				
From Great Britain	.....	\$32	.....	\$234
United States	\$7,150	.....	\$8,005	.....
Totals	\$7,150	\$32	\$8,005	\$234
Webbing—over one inch wide:				
From Great Britain	.....	\$990	.....	\$1,111
United States	\$22,328	.....	\$35,489	.....
Totals	\$22,328	\$990	\$35,489	\$1,111

*In addition the imports of rubber cement and all manufactures of India rubber and gutta percha not otherwise provided for amounted to \$58 from Great Britain and \$794 from various countries for May; and \$58 from Great Britain and \$7,318 from various countries for the two months ending May, 1916, the values being at treaty rates.

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	May, 1916.		Two Months Ending May, 1916.	
	Prod- ucts of Canada Value.	Re-exports of foreign goods. Value.	Prod- ucts of Canada Value.	Re-exports of foreign goods. Value.
Manufactured—dutiable:				
Belting:				
To Newfoundland	\$192	.....	\$631	.....
Hose:				
To Great Britain	\$56,468	.....	\$74,537	.....
United States	1,335	\$125	1,335	\$125
Newfoundland	697	.....	885	.....
Other countries	646	.....	747	.....
Totals	\$59,146	\$125	\$77,494	\$125
Boots and shoes:				
To Great Britain	\$48,131	.....	\$61,674	.....
United States	14	\$15	30	\$15
Newfoundland	1,375	.....	1,654	.....
Australia	550	.....	550	.....
New Zealand	625	.....	625	.....
Other countries	911	.....	2,248	.....
Totals	\$51,639	\$15	\$66,771	\$15
Clothing:				
To Newfoundland	\$150	.....	\$150	.....

	May, 1916.		Two Months Ending May, 1916.	
	Prod. use of Canada.	Re-exports of foreign goods.	Prod. use of Canada.	Re-exports of foreign goods.
MANUFACTURED	Pounds.	Value.	Pounds.	Value.
Fires:				
To Great Britain	\$43,086		\$120,845	
United States	3,304	\$1,102	35,080	\$2,326
Newfoundland	136		1,346	
Other countries	27,533		29,362	
Totals	\$73,949	\$1,102	\$176,523	\$2,326
Rubber waste:				
To Great Britain	\$1,797		\$9,020	
United States	23,156		38,587	
Totals	\$24,853		\$47,607	
All other mfrs., N. O. P.				
To Great Britain	\$9,799		\$11,822	
United States	209	\$950	407	\$1,150
Newfoundland	116		470	
Other countries	421	258	697	516
Totals	\$10,545	\$1,208	\$13,396	\$1,666
Gum chicle:				
To United States	\$112,819		\$227,679	

*During May 14,200 pounds of rubber waste was exported to Great Britain and 387,900 pounds to the United States; and 75,100 pounds to Great Britain and 582,000 pounds to the United States for the two months ending May, 1916.

†During May 201,561 pounds of gum chicle was exported to the United States, making a total of 382,283 pounds for the two months ending May, 1916.

UNITED KINGDOM RUBBER STATISTICS.

	IMPORTS.		Seven Months Ending July, 1916.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED				
Crude rubber:				
From Dutch East Indies	868,900	\$545,399	5,756,700	\$4,035,423
French West Africa	86,530	33,661	1,179,000	619,543
Gold Coast	37,241	17,291	1,102,900	451,863
Other countries in Africa	739,000	331,850	5,151,400	2,691,176
Peru	37,100	13,151	887,500	598,577
Brazil	1,092,500	621,997	15,028,700	10,070,591
British India	151,600	96,675	2,332,500	1,729,750
Straits Settlements and dependencies, including Labuan	2,832,000	1,625,952	29,217,400	21,376,552
Federated Malay States	3,891,600	2,581,472	19,979,800	14,522,603
Ceylon and dependencies	1,326,000	836,348	11,904,400	8,815,661
Other countries	285,300	182,440	1,868,800	1,305,328
Totals	11,443,500	\$6,946,886	94,409,600	\$66,217,067
Waste and reclaimed rubber:				
Gutta percha	463,800	\$202,054	4,235,200	1,954,546
MANUFACTURED				
Apparel, waterproofed	22,124	\$1,888	127,025	\$40,056
Boots and shoes, down pairs	60,974	127,025	1,153,753	376,145
Insulated wire	.....	.....	.....	30,292
Submarine cables	.....	.....	.....	8,312,200
Automobile tires and tubes	.....	.....	.....	\$52,860
Motorcycle tires and tubes	.....	.....	.....	329,284
Cycle tires and tubes	.....	.....	.....	32,882
Tires not specified	.....	.....	.....	.....

	EXPORTS.		Seven Months Ending July, 1916.	
	Pounds.	Value.	Pounds.	Value.
MANUFACTURED				
Apparel, waterproofed
To France	\$65,921	.....	\$253,660
British East Indies	15,396	.....	106,359
United States	18,294	.....	105,744
New Zealand	21,253	.....	178,561
Canada	10,439	.....	112,056
Other countries	54,976	.....	163,417
Totals	\$330,198	.....	\$1,665,501
Boots and shoes, down pairs	14,628	\$52,059	60,500	\$303,599
Insulated wire	182,517	.....	1,415,951
Submarine cables	154,244	.....	1,224,480
Automobile tires and tubes	800,780	.....	3,311,779
Motorcycle tires and tubes	66,659	.....	263,684
Cycle tires and tubes	296,577	.....	2,068,455
Tires not specified	105,644	.....	632,997
Manufactures not specified	764,896	.....	4,448,387

EXPORTS—FOREIGN AND COLONIAL.

	July, 1916.		Seven Months Ending July, 1916.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED				
Crude rubber:				
To Russia	562,200	\$193,679	6,586,300	\$4,815,569
France	1,927,500	1,122,533	11,761,200	\$7,866,394
United States	3,015,700	1,876,009	37,307,200	27,786,224
Other countries	1,678,900	1,090,025	11,038,500	7,753,353
Totals	7,204,300	\$4,532,246	66,693,200	\$49,161,504

	July, 1916.		Seven Months Ending July, 1916.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED				
Waste and reclaimed rubber:	135,600	\$20,150	307,700	\$67,125
Crude rubber:	12,700	6,862	291,800	155,209
MANUFACTURED				
Apparel, waterproofed	.....	\$554	.....	\$1,370
Boots and shoes, down pairs	.....	2,155	18,495	105,666
Insulated wire	.....	5,025	.....	69,065
Automobile tires and tubes	.....	346,427	.....	2,442,069
Motorcycle tires and tubes	.....	14,259	.....	53,475
Cycle tires and tubes	.....	2,858	.....	110,456
Tires not specified	.....	.....	.....	4,555

LONDON AND LIVERPOOL RUBBER STATISTICS.

	IMPORTS.		LONDON.		LIVERPOOL.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED						
Crude rubber:						
From German West Africa	.....	.....	.....	.....	99,200	\$36,326
Java	172,500	\$105,831	.....	.....	11,200	1,215
Dutch Borneo	.....	2,678	.....	.....	.....	.....
Other Dutch Possessions in Indian Seas	685,000	438,352	.....	.....	.....	.....
France	.....	1,700	.....	2,191	.....	.....
French West Africa	.....	76,300	.....	28,320	.....	.....
Madagascar	11,300	5,832	.....	.....	.....	.....
Portuguese W. Africa	5,509	2,430	.....	.....	16,800	2,187
Portuguese E. Africa	.....	.....	.....	.....	.....	.....
Spain	.....	3,400	.....	2,041	.....	.....
Mexico	3,600	2,349	.....	.....	.....	.....
Colombia	400	224	.....	.....	.....	.....
Peru	.....	.....	27,100	13,011	.....	.....
Brazil	2,200	972	1,090,300	621,025	.....	.....
Uruguay	.....	.....	2,200	635	.....	.....
Bolivia	.....	.....	26,300	13,750	.....	.....
Gold Coast	.....	.....	141,000	57,941	.....	.....
Nigeria	.....	.....	24,400	12,544	.....	.....
Cane of Good Hope	37,600	24,980	.....	.....	.....	.....
Zanzibar and Pemba	600	292	.....	.....	.....	.....
British East Africa	5,300	3,859	.....	5,100	.....	6,907
Uganda	5,100	2,678	.....	.....	.....	.....
Nyasaland	5,300	2,552	.....	.....	.....	.....
Anglo-Egyptian Sudan	5,300	3,859	.....	.....	.....	.....
British India	.....	150	.....	.....	.....	.....
Straits Settlements	2,579,700	1,082,747	253,300	143,105	.....	.....
Malay States	3,885,000	2,577,598	6,600	3,873	.....	.....
Ceylon and Dependencies	1,305,600	816,475	21,300	19,862	.....	.....
British North Borneo	237,200	156,409	.....	.....	.....	.....
Fiji Islands	6,900	3,761	.....	.....	.....	.....
British Guiana	1,200	642	.....	.....	.....	.....
Totals	9,105,400	\$5,327,346	1,812,100	\$966,661	.....	.....
Waste and reclaimed rubber:						
From Java	7,800	\$729	.....	.....	.....	.....
United States	27,400	11,115	53,400	\$11,081	.....	.....
Channel Islands	600	194	.....	.....	.....	.....
Egypt	300	29	.....	.....	.....	.....
Malta	10,300	573	.....	.....	.....	.....
Cape of Good Hope	8,900	626	.....	.....	.....	.....
Natal	8,100	447	.....	.....	.....	.....
British India	33,200	3,892	.....	.....	.....	.....
Ceylon and Dependencies	6,800	355	.....	.....	.....	.....
New Zealand	12,300	510	.....	.....	.....	.....
British Honduras	300	117	.....	.....	.....	.....
Totals	148,300	\$17,587	53,400	\$11,081	.....	.....

EXPORTS

	Waste and reclaimed rubber.		Mfrs. of the United Kingdom.	
	Pounds.	Value.	Pounds.	Value.
To Sweden	700	\$729	.....	.....
Norway	45,300	8,383	14,400	\$1,351
Denmark	80,500	54,234	7,600	408
Italy	84,500	4,695	2,500	573
Spain	.....	.....	7,100	714
United States	37,000	23,448	2,400	296
Australia	2,900	408	.....	.....
Totals	504,900	\$37,664	131,100	\$16,961

RE-EXPORTS.

	Crude rubber:		Waste and reclaimed rubber:	
	Pounds.	Value.	Pounds.	Value.
To Russia	111,300	\$74,002	448,000	\$119,900
France	18,300	662,719	11,000	6,318
Denmark	80,500	54,234	.....	.....
Spain	295,700	785,711	880,000	361,671
Switzerland	15,700	11,580	.....	.....
Sweden	6,700	5,137	18,000	13,386
Italy	736,000	485,013	137,400	87,527
United States	2,920,300	1,854,369	29,600	20,866
Canada	.....	.....	99,700	53,416
Czechoslovakia	97,700	194,346	.....	.....
Australia	.....	.....	248,400	141,660
Totals	5,504,500	\$3,533,621	1,543,100	\$1,005,621
Waste and reclaimed rubber:				
To Sweden	7,000	\$1,187	.....	.....
France	.....	.....	23,600	85,026
Denmark	.....	.....	600	83
Totals	7,000	\$1,187	24,200	85,109

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—	Four Months Ending April, 1915.		Four Months Ending April, 1916.	
	Pounds.	Value.	Pounds.	Value.
India rubber and gutta percha—raw and reclaimed:				
From Straits Settlements	734,800	.....	717,640	.....
African Fr. Congo .....	.....	.....	28,820	.....
Belgian Congo .....	.....	.....	124,080	.....
Brazil	1,745,930	.....	2,274,360	.....
Other countries	61,380	.....	624,580	.....
Totals	2,542,100	\$1,561,080	3,768,480	\$2,314,803
Rubber scrap	308,000	\$18,914	2,037,860	\$125,143
MANUFACTURED—				
India rubber and gutta percha—threads:				
From United States	10,780	.....	11,660	.....
Great Britain	10,780	.....	16,380	.....
Other countries .....	.....	.....	660	.....
Totals	21,560	\$34,045	28,600	\$45,162
India rubber and gutta percha—sheets:				
Cut sheets	1,100	\$1,457	440	\$583
Elastic fabric	1,540	473	220	67
Insulated wire .....	.....	52	.....	.....
Hard rubber	1,320	811	24,860	15,266
India rubber and gutta percha—tubes:				
Cut sheets	440	\$656	440	\$656
Elastic fabric:				
From Austria-Hungary	660	.....	.....	.....
Germany	3,080	.....	.....	.....
Other countries	22,440	.....	1,760	.....
Totals	26,180	\$11,254	1,760	\$756
Other forms	1,980	\$955	1,540	\$743
Beltting	14,360	\$7,527	45,540	\$13,972
Rubber coated fabrics.....pieces	28,160	\$29,645	43,560	\$45,857
Other forms:				
From Great Britain	4,620	.....	13,200	.....
Other countries	440	.....	440	.....
Totals	5,060	\$3,329	13,640	\$8,974
Boots and shoes—pairs:				
From United States	0,862	.....	12,575	.....
Austria-Hungary	1,551	.....	.....	.....
France	9,51	.....	10,061	.....
Germany	4,028	.....	.....	.....
Other countries .....	.....	.....	45	.....
Totals	12,473	\$9,629	22,681	\$17,510
Elastic webbing:				
From Austria-Hungary	4,400	.....	.....	.....
France	4,840	.....	.....	.....
Germany	20,900	.....	880	.....
Other countries	7,700	.....	9,680	.....
Totals	37,840	\$53,114	10,560	\$14,822
Elastic fabric—not specified:				
From Austria-Hungary	7,920	.....	134,860	.....
France	5,060	.....	.....	.....
Germany	14,300	.....	45,100	.....
Great Britain	9,51	.....	1,320	.....
Other countries	1,980	.....	.....	.....
Totals	58,300	\$35,891	181,280	\$111,322
Tires:				
From France	42,460	.....	206,140	.....
Germany	2,200	.....	.....	.....
Great Britain	45,760	.....	133,100	.....
Other countries	660	.....	21,340	.....
Totals	91,080	\$102,916	360,580	\$439,604
Other rubber manufactures:				
From Austria-Hungary	9,680	.....	.....	.....
France	3,300	.....	707,300	.....
Germany	55,880	.....	246,840	.....
Great Britain	22,220	.....	187,420	.....
Other countries .....	.....	.....	.....	.....
Totals	206,540	\$73,050	1,131,360	\$500,642
Total Imports .....	.....	\$1,944,708	.....	\$3,655,972

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—	Four Months Ending April, 1915.		Four Months Ending April, 1916.	
	Pounds.	Value.	Pounds.	Value.
India rubber and gutta percha—raw and reclaimed:				
Totals	141,540	\$32,334	388,740	\$92,753
MANUFACTURED—				
India rubber and gutta percha—threads:				
To Germany	5,720	.....	1,760	.....
Great Britain	75,460	.....	2,420	.....
Argentina	1,100	.....	8,360	.....
Other countries	18,260	.....	.....	.....
Totals	25,080	\$39,604	12,540	\$19,802

MANUFACTURED—	Four Months Ending April, 1915.		Four Months Ending April, 1916.	
	Pounds.	Value.	Pounds.	Value.
India rubber and gutta percha—sheets:				
Cut sheets	3,740	\$4,954	2,200	\$2,914
Elastic fabric	1,540	473	.....	.....
Insulated wire	1,100	260	.....	.....
Hard rubber	19,800	12,159	34,100	20,940
India rubber and gutta percha—tubes:				
Cut sheets .....	.....	.....	7,360	\$10,827
Elastic fabric	5,140	\$22,413	25,520	10,970
Other forms	21,780	10,509	38,940	18,788
Beltting	660	347	1,540	811
Elastic webbing:				
To France	660	.....	1,540	.....
Greece	18,040	.....	22,220	.....
Egypt	1,100	.....	6,600	.....
Argentina	15,180	.....	34,320	.....
Brazil	25,520	.....	2,000	.....
Cuba	14,300	.....	7,040	.....
Other countries	16,720	.....	41,800	.....
Totals	91,520	\$128,461	135,520	\$190,321
Elastic fabric—not specified:				
To Spain	660	.....	440	.....
Argentina	1,540	.....	7,920	.....
Brazil	1,100	.....	230	.....
Uruguay	1,100	.....	1,760	.....
Other countries	2,200	.....	5,940	.....
Totals	5,500	\$8,685	16,280	\$25,708
Tires:				
To France .....	.....	.....	87,560	.....
Great Britain .....	.....	.....	2,465,980	.....
Switzerland	208,560	.....	66,000	.....
India and Ceylon	45,320	.....	218,680	.....
Australia	12,320	.....	43,780	.....
Argentina	259,820	.....	350,240	.....
Brazil	118,800	.....	157,520	.....
Other countries	1,574,100	.....	134,200	.....
Totals	2,218,920	\$2,705,780	3,523,960	\$4,163,014
Other rubber manufactures:				
To Great Britain .....	.....	.....	21,340	.....
Switzerland	62,040	.....	4,180	.....
Argentina	39,800	.....	33,560	.....
Other countries	158,840	.....	77,440	.....
Totals	251,680	\$101,762	137,720	\$85,096
Total exports .....	.....	\$3,067,741	.....	\$4,641,844

THE RUBBER SCRAP MARKET.

Copyright 1916.

NEW YORK.

AUGUST is usually a dull month in the rubber scrap market and with the exception of deliveries on contracts there has been but little business to claim attention from the trade. The easy tendency noted a month ago has continued without change for the better, resulting in a heavy market with downward tendencies. Crude rubber continues to be weak and, in fact, the rubber trade in general has been apathetic towards all markets at this time. Price changes have been unimportant and at the close of the month the market was decidedly weak.

BOOTS AND SHOES. It is reported that supplies are not abundant and that spring collections have been absorbed. During the month, sales are said to have been made to the mills for 8½ cents, but 8½ cents is generally considered the outside price.

AUTO TIRES. Tires have continued weak and some concessions in price have been noticed during the month. G. & G. white tires were offered at prices ranging from 8 to 8½ cents delivered, but the mills have not appeared interested. The other grades are unchanged in price and easy in tone.

INNER TUBES. There has been no interest shown in inner tubes, as the manufacturers are apparently well supplied. For No. 1 tubes the delivered price is held nominally at 24½ to 25 cents with buying confined to small lots. Compounds are slow and weak.

MECHANICALS. In mechanical scrap some grades are stagnant and prices generally weak.

LONDON AND LIVERPOOL STATISTICS.

During July 74 tons of waste and reclaimed rubber were imported into London and 252 tons exported during the same period. Liverpool's imports were 26 tons and 65 tons exported.

NEW YORK QUOTATIONS FOR CARLOAD LOTS DELIVERED.

AUGUST 30, 1916.

Prices subject to change without notice.

	Per Pound
Boots and shoes.....	\$0.08 1/2 @ .08 5/8
Trimmed articles.....	.06 3/4 @ .06 7/8
White tires, Goodrich and Goodyear.....	.08 @ .08 5/8
Auto tires, standard mixed.....	.05 @ .05 1/2
Auto tires, standard mixed, stripped, unmounted.....	.04 1/2 @ .04 3/4
Auto peelmats, No. 1.....	.09 1/2 @ .09 3/4
Auto peelmats, No. 2.....	.08 @ .08 1/2
Inner tubes, No. 1.....	.25 @ .25 1/2
Inner tubes, No. 2.....	.11 @ .11 1/2
Inner tubes, No. 2.....	.11 @ .11 1/2
Iron tires.....	.02 @ .02 1/2
Bicycle tires.....	.04 1/2 @ .04 3/4
Solid tires.....	.05 @ .05 1/2
White scrap, No. 1.....	.13 1/2 @ .14 1/4
White scrap, No. 2.....	.10 @ .10 1/2
Red scrap, No. 1.....	.08 @ .09
Mixed black scrap, No. 1.....	.04 @ .04 1/4
Mixed black scrap, No. 2.....	.03 1/2 @ .03 3/4
Rubber car springs.....	.04 @ .04 1/2
Horse shoe pads.....	.04 1/2 @ .04 3/4
Mattings and packings.....	.00 7/8 @ .01
Garden hose.....	.01 1/4 @ .01 1/2
Air brake hose.....	.05 1/4 @ .05 1/2
Cotton fire hose.....	.02 1/2 @ .02 3/4
Large hose.....	.01 1/4 @ .01 1/2
Hard rubber scrap, No. 1, bright fracture.....	.24 @ .25
Battery pans (black compound).....	.02 1/2 @ .02 3/4
Insulated wire stripping.....	.03 @ .03 1/2
Rubber heels.....	.03 1/2 @ .03 3/4

THE MARKET FOR COTTON AND OTHER FABRICS.

Copyright 1916.

NEW YORK

COTTON has had the most sensational price advance during the latter part of August that has occurred at any time for the past 30 years, with the exception of the Sully boom of 1903 and the bull movement led by Patten six years ago, when prices went to 16 cents.

In this recent movement prices advanced 150 points within a week, and on August 25, September contracts, representing the beginning of the new crop movement, went to 15.66, October 15.75, December 15.89, January 15.95, March 16.09, May 16.20 and July deliveries 16.26.

The principal cause of this spectacular advance was the fear of crop shortage that has gradually developed during the past month, due to drought conditions and low crop reports recently issued by the Agricultural Bureau at Washington. The apprehension is that this season's crop will be cut down to 12,000,000 bales against 14,000,000 bales that represented the world's spinners' consumption for last year.

SEA ISLAND COTTON. According to the U. S. Census Bureau the Sea Island crop for the year 1915-16 amounted to 91,920 bales distributed as follows: Georgia, 57,572; Florida, 28,170; South Carolina, 6,178. The commercial crop report figures for 1915-16 are 85,278 bales distributed as follows: South Carolina, 6,211; Georgia and Florida, 79,067. A difference of 6,642 bales is noted in these reports which cannot be definitely accounted for; however, it is known that this year's crop is some 6,000 bales in excess of last year.

EGYPTIAN COTTON. The Alexandria market has been characterized by weakness with scarcely a change in the new or old crop positions. Advances dated July 27 indicate entire absence of buying orders from abroad and a consequent stagnant market. The weather has favored new crop conditions, with the result that the plant has developed too rapidly at this time; however, the coming months of August and September are looked forward to with more anxiety as the plant development at that time is most important.

The recent rise in American cotton has resulted in prices advancing rapidly and the closing of the Egyptian Cotton Exchange.

COTTON FABRICS. The fundamentals that have controlled the cotton fabric situation for the past month are the same, and, moreover, the same market deductions are applied in tire fabrics, hose and belting duck, and textiles generally used in the rubber

trade. The general demand both at home and abroad for all sorts of rubber textiles continues unabated. The textile mills have made extensive plant additions, ordered new equipment, increased the running time and arranged night shifts to take care of the business. Theoretically, production should now equal the demand, but practically it does not, for the labor is not obtainable. For that reason looms are idle, night shifts incomplete and machinery builders unable to make delivery of new equipment.

Following the sensational advance of cotton, prices of cotton fabrics advanced rapidly, and the mills withdrew all old quotations and refused to quote prices at the present time. Under the prevailing circumstances the fabric market is most unfavorable for both seller and buyer, the former threatened by labor and a short crop, and the latter by higher prices.

NEW YORK QUOTATIONS.

AUGUST 28, 1916.

Prices subject to change without notice.

Aeroplane and Balloon Fabrics:	
Wamsutter, S. A. I. L. No. 1, 40-inch.....	yard \$0.26 @
Do. No. 4, 38 1/2-inch.....	.26 @
Do. No. 4, 36-inch.....	.13 @
O/X B.	
Wool Stockinettes—52-inch:	
A—14-ounce.....	yard 1.25 @
B—14-ounce.....	1.50 @
C—14-ounce.....	1.75 @
Cotton Stockinettes—52-inch:	
D—14-ounce.....	.50 @ .55
E—11 1/2-ounce.....	.42 @ .50
F—14-ounce.....	.35 @ .50
G—8-ounce.....	.48 @ .50
H—11-ounce.....	.50 @ .55
I—9-ounce.....	.42 @ .45
Colors—white, black, blue, brown.	
Tire Fabrics:	
12 1/2-ounce Sea Island, combed.....	square yard .90 @
17 1/2-ounce Egyptian, combed.....	.75 @
17 1/2-ounce Egyptian, carded.....	.55 @
17 1/2-ounce Peeler's, carded.....	.52 @
Sheeting:	
40-inch 2.35-yard.....	yard .11 @
40-inch 2.50-yard.....	.10 @
40-inch 2.70-yard.....	.10 @
40-inch 2.85-yard.....	.09 1/4 @
40-inch 3.15-yard.....	.09 @
Onsurgers:	
40-inch 2.25-yard.....	yard .11 1/2 @
40-inch 2.48-yard.....	.11 1/2 @
37 1/2-in. 2.45-yard.....	.11 3/4 @
Mechanical Ducks:	
Hose.....	30 @ 30
Belting.....	30 @ 30
Carriage Cloth Duck:	
38-inch 2.00-yard enameling duck.....	yard .15 @ .16
38-inch 1.74-yard.....	.17 @ .17 1/2
72-inch 16.66-ounce.....	.35 @
72-inch 17.21-ounce.....	.36 @ .37
Drills:	
38-in-ch 2.60 yard.....	yard .14 1/2 @
40-in-ch 2.47 yard.....	.14 1/2 @
52-inch 1.90-yard.....	.16 @
53-inch 1.95-yard.....	.15 1/2 @
53-inch 1.52-yard.....	.21 @
Yarns:	
Garden Hose, 12 1/2 cabled.....	pound .33 @ .34
Fire Hose 12 1/2.....	.30 @
Imported Woolen Fabrics Specially Prepared for Rubberizing—Plain and Fancies:	
63-inch, 3 1/2 to 7 1/2 ounces.....	square yard .38 @ 1.55
Imported Plaid Lining (Union and Cotton):	.35 @ .85
63-inch, 2 to 4 ounces.....	.35 @ .75
36-inch, 2 to 4 ounces.....	.20 @ .45
Domestic Woven Fabrics:	
36-inch, 4 1/2 to 8 ounces.....	square yard .25 @ .45
Domestic Woven Plain Linings (Cotton):	
36-inch, 3 1/2 to 5 ounces.....	square yard .15 1/2 @ .20
Barlags:	
Romazine.....	yard .06 @ .08
Twills.....	.10 @ .15
Twined.....	.20 @ .35
Plaid.....	.06 @ .15
Repp.....	.08 @ .10
Repp.....	.18 1/2 @ .25
Burgs:	
32-7 1/2-ounce.....	100 yard 6.30 @
40-7 1/2-ounce.....	6.65 @
40-8-ounce.....	6.75 @
40-10-ounce.....	8.10 @
40-10 1/2-ounce.....	8.30 @
45-7 1/2-ounce.....	7.85 @
45-8-ounce.....	8.00 @
48-10-ounce.....	11.30 @

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

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NEW YORK.

It was generally known that the mills had anticipated their summer requirements to the extent of laying in sufficient stocks or arranging for contract deliveries covering August and September so that the extreme dullness in rubber chemicals for the past month was expected. Very little change has been noted in local market conditions and prices, and unless something new unforeseen should occur there is not much movement expected for the next six weeks.

The Department of Commerce, Bureau of Census, has issued the following figures on the production for 1914 of various compounding ingredients, most of which show an increase in value during the period between 1909-1914.

Ingredients.	1914.	Per Cent. of Value Increase (+) or Decrease (-)
Pounds.	Value.	1909-1914.
Bone black	44,509,000	\$1,532,000 +43.1
Carbon black	22,623,000	900,000 +44
Lampblack	5,747,317	517,167 +17.6
Barytes	46,920,380	325,922 6.5
Lithopone	48,972,062	1,857,510
Chrome yellow	5,747,317	641,534
Prussian blue	1,239,389	229,639
Ultramarine	2,698,639	222,769
Vermilion (true)	322,759	200,134 +86.2

ANTIMONY SULPHURETS. There has been no change in prices or market conditions controlling this commodity. The domestic producers of both crimson and golden antimony are apparently meeting the requirements of the trade.

BARYTES. The foreign demand has continued and domestic consumption appears to be larger than normal. Prices have undergone no change, but are firm despite the fact that production of barytes has increased materially in this country during the past year.

LITHARGE. There has been no change in the fundamentals controlling this commodity which has been generally firm, and sellers are inclined to predict higher prices for that reason; however, values remain the same and the mills appear to be uninterested.

LITHOPONE. Foreign grades have been freely quoted during the month and domestic business has been confined principally to contract deliveries. In some cases forward sales have been reported covering the balance of the year, yet some producers are said to be in a position to make spot deliveries.

SULPHURIC ACID. The call has been steady and prices unchanged. Liberal offerings for spot and futures reflect the activity of the producers who are striving to meet the increasing demand at home and abroad.

WHITING. The market is still dominated by the high price of chalk and is routine in character. The demand is good and contract deliveries are regularly made, although a few producers are having difficulty in obtaining supplies of the raw material.

NEW YORK QUOTATIONS.

AUGUST 29, 1916.

Subject to change without notice.

Acetone (drums)	..	..	..	..	..
Acid, acetic, 28 per cent. (bbls.)	..	..	..	..	..
Acid, cresylic (cruke)	..	..	..	..	..
glacial, 99 per cent. (carboys)	..	..	..	..	..
muratic, 20 degrees	..	..	..	..	..
nitric, 36 degrees	..	..	..	..	..
sulphuric, 60 degrees	..	..	..	..	..
Alumina pigment, No. 1 (sacks)	..	..	..	..	..
Aluminum flake (cardboard)	..	..	..	..	..
Ammonium carbonate	..	..	..	..	..
Antimony, crimson, sulphur of (casks)	..	..	..	..	..
crimson, "Mephisto" (casks)	..	..	..	..	..
golden, sulphur of (casks)	..	..	..	..	..
golden, "Mephisto"	..	..	..	..	..
Asbestos	..	..	..	..	..
Asbestos, golden, sulphur of, States brand, 16-17 per cent. lb.	..	..	..	..	..
Asphaltum	..	..	..	..	..
Barytes, pure white	..	..	..	..	..
off color	..	..	..	..	..

Basofo	..	..	..	..	..
Benzoil, pure	..	..	..	..	..
Beta-Naphthol	..	..	..	..	..
Black Hivo	..	..	..	..	..
Bone ash	..	..	..	..	..
black	..	..	..	..	..
Cadmium tri-sulphate (f. o. b. London)	..	..	..	..	..
yellow	..	..	..	..	..
Camella gum	..	..	..	..	..
Carbon, bisulphide (drums)	..	..	..	..	..
black (cases)	..	..	..	..	..
tetrachloride (drums)	..	..	..	..	..
Caustic soda, 76 per cent.	..	..	..	..	..
Chalk, precipitated, heavy	..	..	..	..	..
precipitated, light	..	..	..	..	..
China clay, domestic	..	..	..	..	..
limited	..	..	..	..	..
Chrome, green (pure)	..	..	..	..	..
yellow	..	..	..	..	..
Coal tar	..	..	..	..	..
Corn oil, refined	..	..	..	..	..
Cotton linters	..	..	..	..	..
Fossil flour	..	..	..	..	..
Gas black	..	..	..	..	..
Gilsonite	..	..	..	..	..
Glycerine, C. P. (drums)	..	..	..	..	..
Graphite, flake (400 pound bbl.)	..	..	..	..	..
powdered (400 pound bbl.)	..	..	..	..	..
Green oxide of chromium (casks)	..	..	..	..	..
Ground glass (fine)	..	..	..	..	..
Indian red, reduced grades	..	..	..	..	..
pure	..	..	..	..	..
Infusorial earth, powdered	..	..	..	..	..
bolted	..	..	..	..	..
Iron oxide, red, reduced grades	..	..	..	..	..
red, pure, bright	..	..	..	..	..
Ivory black	..	..	..	..	..
Lampblack	..	..	..	..	..
Lead, red oxide of	..	..	..	..	..
sublimed blue	..	..	..	..	..
sublimed white	..	..	..	..	..
white, basic carbonate	..	..	..	..	..
white, basic sulphate	..	..	..	..	..
Lime, flour	..	..	..	..	..
Litharge	..	..	..	..	..
sublimed	..	..	..	..	..
Lithopone, domestic	..	..	..	..	..
Imported	..	..	..	..	..
Magnesia, carbonate	..	..	..	..	..
calcined, heavy	..	..	..	..	..
heavy, Thistle Brand	..	..	..	..	..
Magnetite, calcined, powdered	..	..	..	..	..
Mica, powdered	..	..	..	..	..
Mineral rubber	..	..	..	..	..
"M. R. X."	..	..	..	..	..
"Genasco"	..	..	..	..	..
"M. R."	..	..	..	..	..
"Richmond Brand"	..	..	..	..	..
"No. 64 Brand"	..	..	..	..	..
Naphtha, stove gasoline (steel bbls.)	..	..	..	..	..
66-68 degrees	..	..	..	..	..
68-70 degrees	..	..	..	..	..
V. M. & Co.	..	..	..	..	..
Oil, aniline	..	..	..	..	..
linseed (bbl.)	..	..	..	..	..
palme	..	..	..	..	..
paraffin	..	..	..	..	..
pine (cases)	..	..	..	..	..
rapeseed	..	..	..	..	..
rosin, heavy body	..	..	..	..	..
tar (cases)	..	..	..	..	..
soluble aniline colors, yellow, orange, red, violet	..	..	..	..	..
Orange mineral, domestic	..	..	..	..	..
Paragol (cardboards)	..	..	..	..	..
Petrolatum	..	..	..	..	..
Petroleum grease	..	..	..	..	..
Pine solvent	..	..	..	..	..
Pitch, burgundy	..	..	..	..	..
pine	..	..	..	..	..
Plaster of paris	..	..	..	..	..
Prussian blue	..	..	..	..	..
Pumice stone, powdered (bbls.)	..	..	..	..	..
Resin, Pontianak, refined	..	..	..	..	..
granulated	..	..	..	..	..
fused	..	..	..	..	..
Rosin (280 pound bbls.)	..	..	..	..	..
Rotten stone, powdered	..	..	..	..	..
Rubber black	..	..	..	..	..
Rubber substitute, black	..	..	..	..	..
brown	..	..	..	..	..
Rubillite	..	..	..	..	..
Shellac, fine orange	..	..	..	..	..
Sandstone, powdered	..	..	..	..	..
Starch, extra, powdered	..	..	..	..	..
Sulphur chloride (drums)	..	..	..	..	..
Sulphur, Bear, velvet, Bear brand (cardboards)	..	..	..	..	..
Tal, American	..	..	..	..	..
Tal, French	..	..	..	..	..
Tal, pure	..	..	..	..	..
Triphosphate, powdered	..	..	..	..	..
Turpentine, Russian gum	..	..	..	..	..
wood	..	..	..	..	..
Vermilion	..	..	..	..	..
Ultramarine blue	..	..	..	..	..
Vermilion, brilliant	..	..	..	..	..
Chinese	..	..	..	..	..
English	..	..	..	..	..

Wax, beeswax, white	lb.	40	@	50
cream, white	lb.	34	@	36
caribula	lb.	30	@	35
crocodile, black	lb.	50	@	50
montan	lb.	80	@	90
paraffin, refined, 18/120 m. p. (cases)	lb.	60	@	60
123/125 m. p. (cases)	lb.	60	@	60
120/120 m. p. (cases)	lb.	58	@	58
133/136 m. p. (cases)	lb.	60	@	60
crude, white, 117/119 m. p. (bbbls)	lb.	60	@	60
yellow, 124/126 m. p. (bbbls)	lb.	55	@	55
Whiting, Alaska	wt.	60	@	70
commercial	wt.	75	@	100

gubbers	wt.	85	@	100
base, white, American	wt.	95	@	100
French coffee	wt.	125	@	150
Wood pulp XXX (airloads)	ton	100	@	100
Yellow ochre (Satin)	lb.	100	@	100
Zinc oxide, American process, horsehead brand	lb.	1015	@	1015
French process, green seal, f. o. b. factory	lb.	1015	@	1015
red seal, f. o. b. factory	lb.	1015	@	1015
white seal, f. o. b. factory	lb.	1015	@	1015
Zinc substitutes	lb.	0115	@	0115
Zinc sulphide, pure	lb.	15	@	15

COMPARATIVE NEW YORK PRICES OF IMPORTANT RUBBER COMPOUNDING INGREDIENTS.

FROM AUGUST, 1914, TO AUGUST, 1916.

	August.	Sept.	1916	April.	January.	October.	July.	1915	April.	January.	1914	August.	
White lead, basic carbonate, American, dry, lb.	80	@	80	@	61	@	5	@	5	@	51	@	54
basic carbonate, lb.	80	@	80	@	61	@	5	@	5	@	51	@	54
litharge, American, powdered	10	@	11	@	10	@	11	@	11	@	93	@	93
English glassmakers	10	@	11	@	10	@	11	@	11	@	93	@	93
Red lead, American	10	@	11	@	10	@	11	@	11	@	93	@	93
French	10	@	11	@	10	@	11	@	11	@	93	@	93
Orange mineral, American	10	@	11	@	10	@	11	@	11	@	93	@	93
French	10	@	11	@	10	@	11	@	11	@	93	@	93
French	10	@	11	@	10	@	11	@	11	@	93	@	93
Zinc oxide, white	10	@	11	@	10	@	11	@	11	@	93	@	93
German (French process)	10	@	11	@	10	@	11	@	11	@	93	@	93
red seal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
green seal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
white seal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
French, red seal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
green seal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
American process	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
French process, red seal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
green seal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
white seal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
Barytes, prime white, foreign, per ton	40	@	40	@	24	@	25	@	25	@	19	@	23
domestic, prime white or floated, f. o. b. works, 25.00 @ 38.00	30.00	@	39.00	@	30.00	@	38.00	@	30.00	@	17.00	@	18.00
of colls., 25.00 @ 28.00	25.00	@	28.00	@	15.00	@	16.00	@	15.00	@	17.00	@	18.00
Blanc fixe, bulk, original casks, 1,000 lbs. each per ton	120.00	@	120.00	@	70.00	@	45.00	@	45.00	@	40.00	@	43.00
dry (in bbls. of 600 lbs.)	40	@	40	@	24	@	25	@	25	@	19	@	23
DRY COLORS.													
Black—													
Raw, lb.	4	@	8	@	3	@	5	@	5	@	2	@	5
Drop, lb.	7	@	12	@	6	@	12	@	6	@	5	@	8
Every, lb.	16	@	25	@	16	@	25	@	16	@	12	@	18
Carbon black, lb.	14	@	30	@	10	@	12	@	8	@	4	@	6
Lanthanum, lb.	12	@	18	@	14	@	18	@	5	@	3	@	7
Blues—													
French, lb.	10	@	11	@	10	@	11	@	10	@	11	@	11
Chinese, lb.	1.50	@	2.00	@	1.80	@	2.25	@	2.00	@	2.25	@	2.25
Prussian, lb.	1.50	@	2.00	@	1.80	@	2.25	@	2.00	@	2.25	@	2.25
Prussian, foreign, lb.	1.50	@	2.00	@	1.80	@	2.25	@	2.00	@	2.25	@	2.25
Soluble, lb.	1.50	@	2.00	@	1.80	@	2.25	@	2.00	@	2.25	@	2.25
Ultramarine, lb.	10	@	40	@	10	@	40	@	10	@	40	@	40
Browns—													
Sumatra, Indian, burnt and considered, lb.	6	@	8	@	5	@	7	@	5	@	4	@	6
Chinese, powdered, lb.	6	@	8	@	5	@	7	@	5	@	4	@	6
American, burnt and powdered, lb.	6	@	8	@	5	@	7	@	5	@	4	@	6
Spanish brown, ton	16.00	@	20.00	@	16.00	@	20.00	@	16.00	@	20.00	@	20.00
Umber, Turkey, burnt and powdered, lb.	1	@	7	@	1	@	7	@	1	@	7	@	7
raw and powdered, lb.	1	@	7	@	1	@	7	@	1	@	7	@	7
American burnt, lb.	1	@	7	@	1	@	7	@	1	@	7	@	7
raw, lb.	1	@	7	@	1	@	7	@	1	@	7	@	7
Vandyke brown, lb.	10	@	10	@	10	@	10	@	10	@	10	@	10
soluble, lb.	10	@	10	@	10	@	10	@	10	@	10	@	10
Greens—													
Chrome, chemically pure, lb.	50	@	60	@	80	@	85	@	30	@	40	@	40
French, lb.	15	@	15	@	20	@	25	@	15	@	20	@	25
Indian, lb.	15	@	15	@	20	@	25	@	15	@	20	@	25
common, lb.	15	@	15	@	20	@	25	@	15	@	20	@	25
Reds—													
Carmine, No. 40, bulk, lb.	4.50	@	5.00	@	5.00	@	6.50	@	3.50	@	4.00	@	4.50
French, lb.	5	@	6	@	5	@	6	@	5	@	6	@	6
Indian red, standard, lb.	5	@	6	@	5	@	6	@	5	@	6	@	6
Rose pink, lb.	5	@	6	@	5	@	6	@	5	@	6	@	6
French, lb.	5	@	6	@	5	@	6	@	5	@	6	@	6
American red, lb.	5	@	6	@	5	@	6	@	5	@	6	@	6
Ochre, red, lb.	2.75	@	3.25	@	2.75	@	3.25	@	2.75	@	3.25	@	3.25
Pink pure (toners), lb.	2.75	@	3.25	@	2.75	@	3.25	@	2.75	@	3.25	@	3.25
American, English, lb.	2.75	@	3.25	@	2.75	@	3.25	@	2.75	@	3.25	@	3.25
Yellows—													
Cosmetic, chemically pure, lb.	10	@	35	@	40	@	40	@	10	@	35	@	35
French, lb.	10	@	35	@	40	@	40	@	10	@	35	@	35
French, golden, lb.	10	@	35	@	40	@	40	@	10	@	35	@	35
domestic, ton	10.00	@	30.00	@	20.00	@	30.00	@	18.00	@	26.00	@	30.00
soluble, lb.	10	@	35	@	40	@	40	@	10	@	35	@	35



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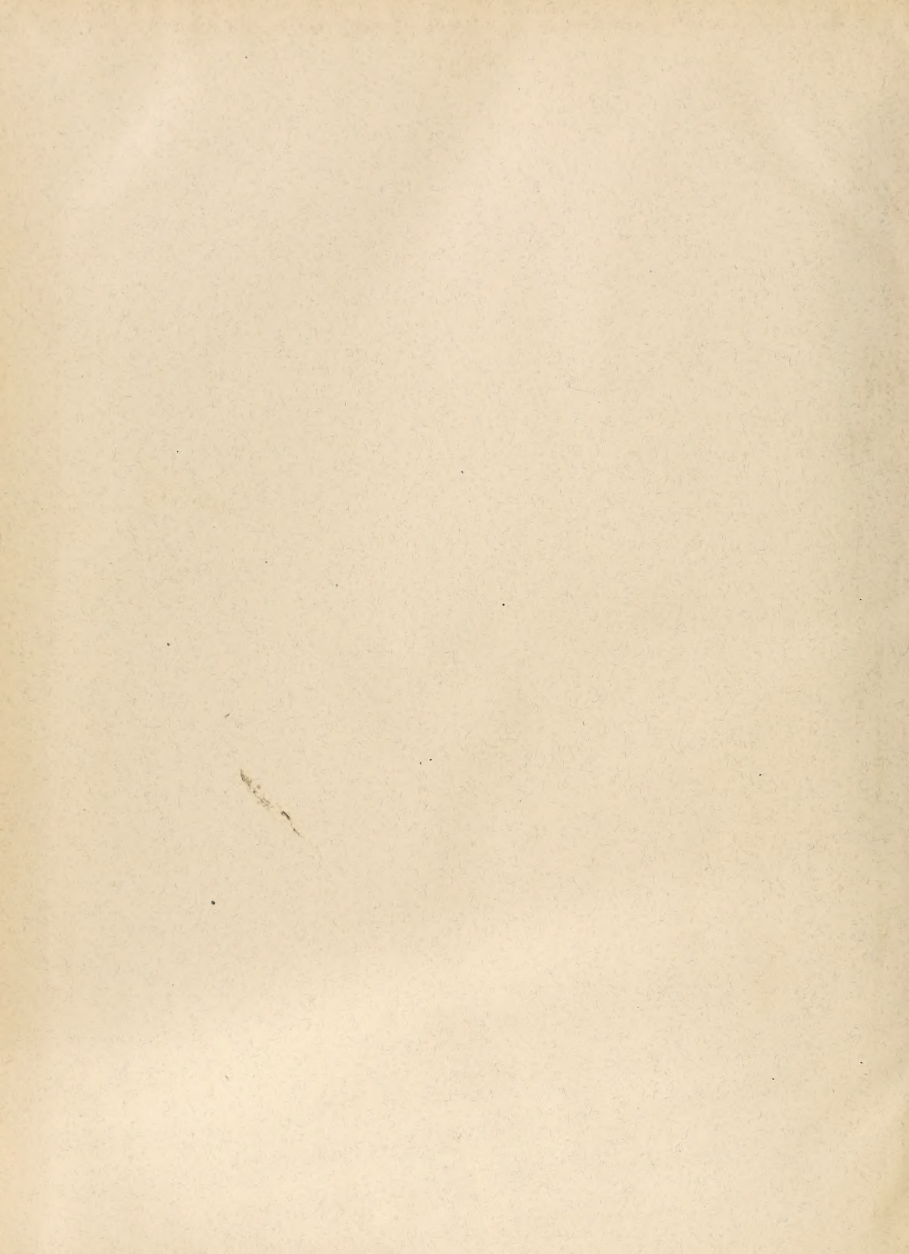
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REMARKABLE TIRE RECORD.

The record run, 5 days 18 hours and 22 minutes, recently made from New York to San Francisco by S. B. Stevens, under the auspices of the American Defence Society, to try out the possibilities of the automobile in time of war, was accomplished on Silvertown tires. The distance between New York and Omaha, 1,485 miles, was made in 48 hours without tire trouble. The same set of tires were used as far as Cheyenne, about 450 miles farther, where they were changed as a matter of precaution. According to Mr. Stevens, they exhibited but little signs of wear on his arrival at San Francisco.

In the manufacture of garters in Great Britain, the webbings and threads are made there, but practically all of the metal clip ends are imported from the United States. Previous to the war many French garters were imported into England, but that trade has now almost entirely ceased.



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